DECEMBER 19, 1936

Railway Age

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GENEVA COLLEGE

A Merry Christmas to You

Pullman-Standard Car Manufacturing Company

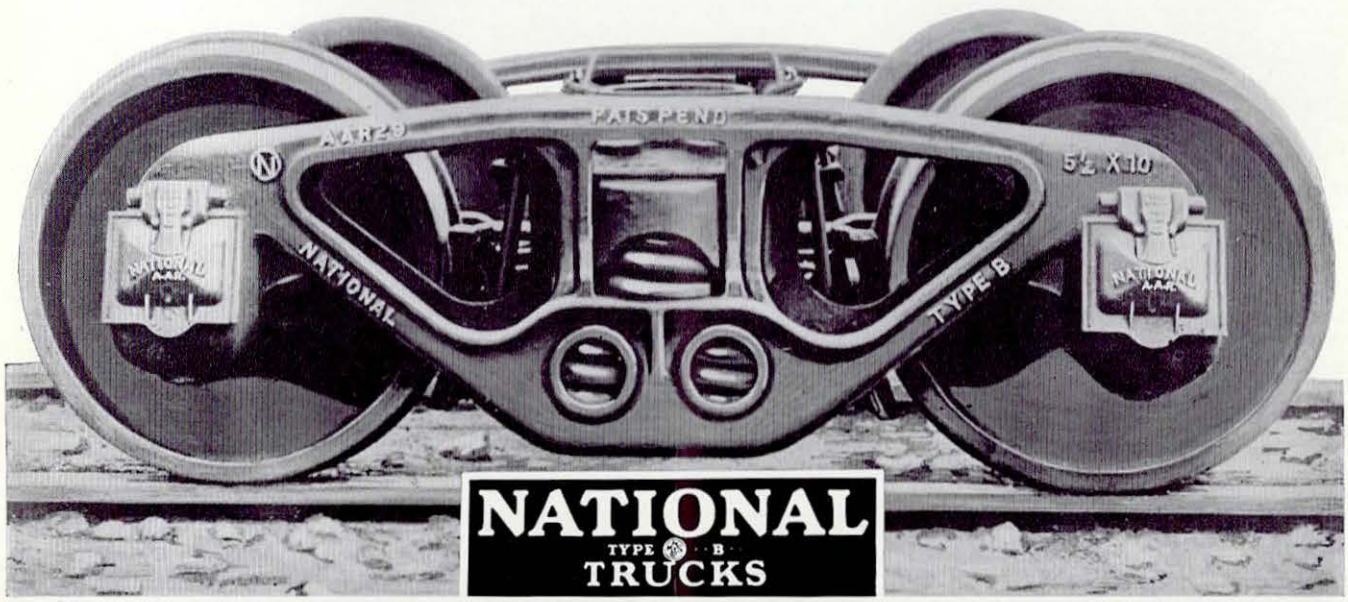
NATIONAL TYPE B TRUCKS PAY BIG DIVIDENDS

BIG DIVIDENDS result from the use of the National Type B Spring-Plankless Trucks. The outstanding features incorporated in their complete design place them in the front rank of money saving products.

Foremost economies result from their ability to keep cars in revenue service longer. This is due to their unique design and superior construction.

Efficient principles developed and incorporated in Type B Trucks include: Quick wheel changes—Elimination of spring plank—New and safer spring arrangement—Integral brake beam safety ledges—Journal box water ledge—Deep and wide spring seat—Short and wide columns—Wide and deep bolster and self-squaring features.

These combined advantages and many others proven during the past five years of service will provide a maximum return on your investment.



NATIONAL MALLEABLE AND STEEL CASTINGS CO.
General Offices: CLEVELAND, OHIO
Sales Offices: New York, Philadelphia, Chicago, St. Louis, San Francisco
Works: Cleveland, Chicago, Indianapolis, Sharon, Pa., Melrose Park, Ill.

Canadian Representatives: Railway and Power Engineering Corporation, Ltd., Toronto and Montreal

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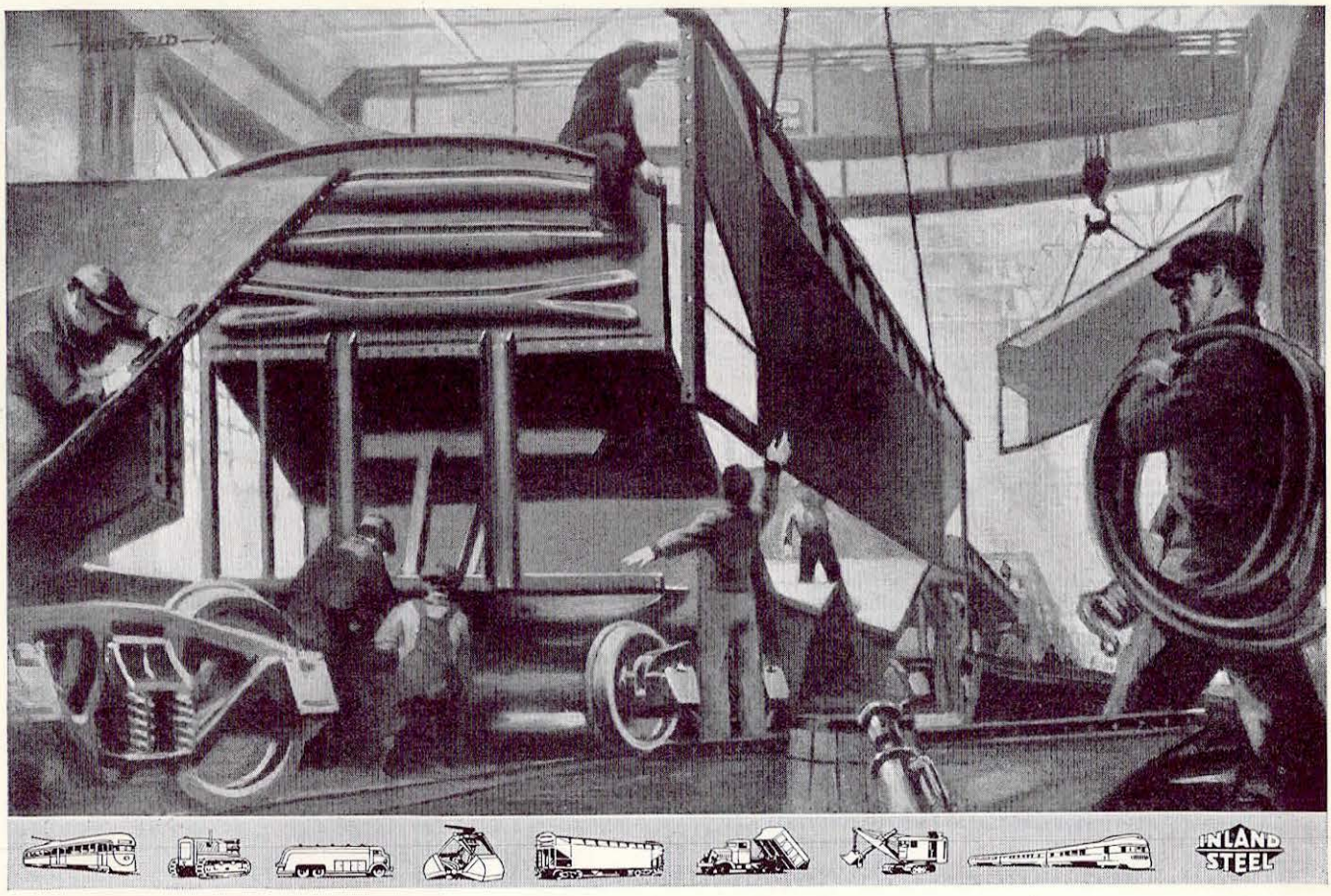


The New High-Strength Alloy

. . INLAND HI-STEEL

Banishes Useless Weight

On any piece of mobile, heavy equipment, carrying around useless weight costs much more than its elimination with Inland's new alloy—Hi-Steel (High in Strength, High in Corrosion Resistance). • HI-Steel has twice the strength of carbon steel — drastically reducing dead weight. Its chemical analysis and the methods used, assure a high degree of uniformity. It is readily welded, cut, formed, and otherwise fabricated. • HI-Steel resists corrosion and lasts many times longer than ordinary steel. Users secure long life at low cost, and without sacrificing the strength and stamina of steel. • The railroads, car builders, manufacturers of trucks, excavators, and other heavy equipment are already turning to this new, modern alloy steel for lighter, faster, more efficient products. • Inland's experienced metallurgists are eager to help you determine how HI-Steel can reduce the weight and increase the strength of the products you make. Bulletin No. 10 will be mailed on request.

THE MILL and THE MEN . . . *that's* INLAND

Inland Steel Company is one of the largest producers in the country; its range of products is broad and comprehensive. • Inland Men are well known for their seasoned experience—their skill and operating team work. • Each Inland Mill is recognized as typifying the most recent achievements of modern engineering—embracing every new improvement for producing quality steel. • Both Mills and Men are at your service.

Principal Products

SHEETS	STRIP	TIN PLATE
PLATES	STRUCTURALS	PILING
RAILS	TRACK ACCESSORIES	
BARS	RIVETS	BILLETS

INLAND STEEL CO.

General Offices: 38 South Dearborn Street, Chicago, Illinois

DELAWARE & HUDSON INSTALLS

South leg of Y at WX (Watervliet Jct.)
In service Oct. 15, 1936.

"the D&H"

Looking north at North Gate.
Placed in service Nov. 10, 1936.

The Delaware and Hudson Railroad Corp. was confronted with a problem of rebuilding an old worn out pneumatic interlocking plant in Albany. The problem was solved by including this layout in the Control Machine of a G-R-S Centralized Traffic Control System then under consideration.

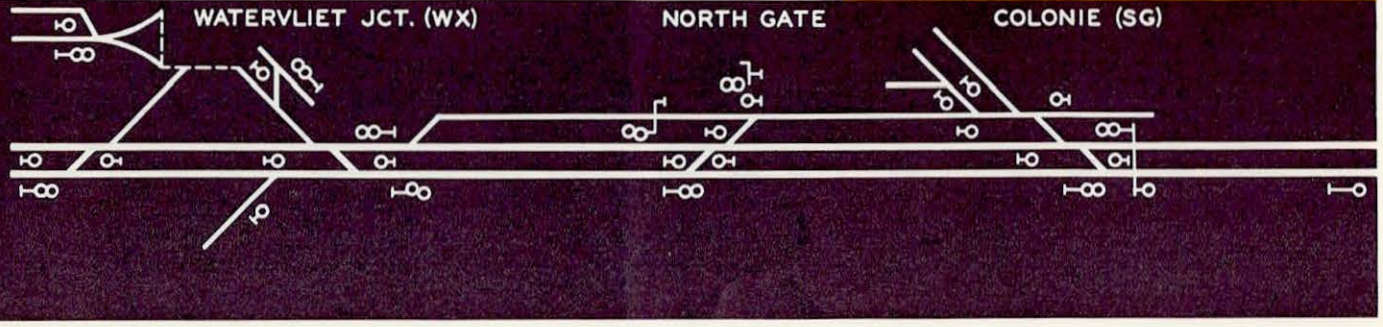
This will result in substantially decreasing operating costs and at the same time will facilitate train movements.

This system, extending from Albany to Watervliet, is the latest development in G-R-S Centralized Traffic Control. The control machine is built of individual vertical units. New track locations, either within or without the present controlled territory, can be incorporated into the system by merely inserting additional units in the control machine.

If you have a similar problem, consider the flexibility of G-R-S Centralized Traffic Control which provides for easy expansion as increased traffic necessitates and funds become available. Our nearest office will make a study without obligation.

Unit plan provides for easy

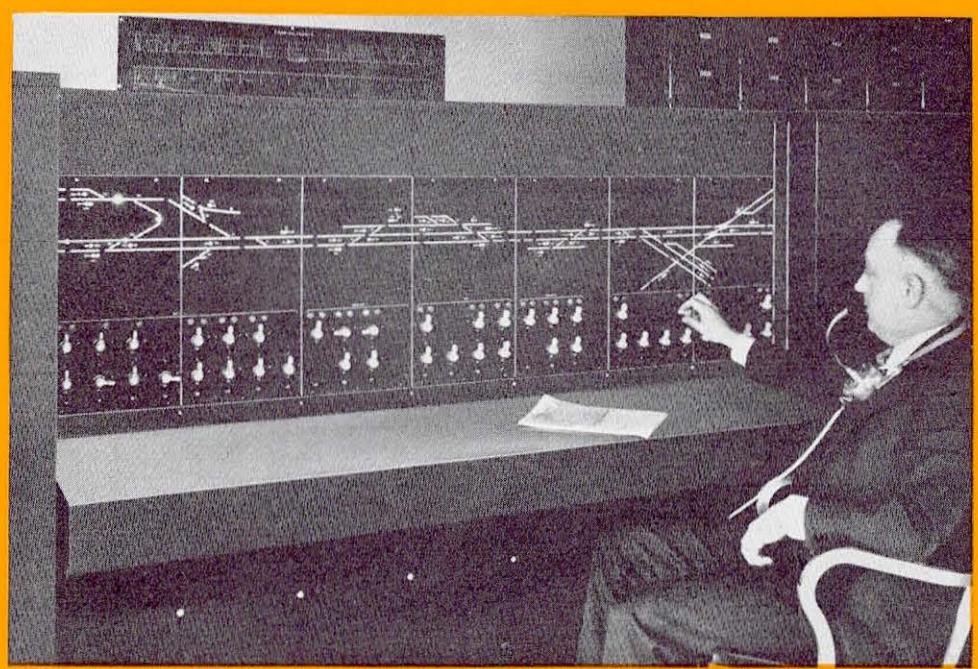
E·X·P·A·N·S·I·O·N



ANOTHER G-R-S cTc SYSTEM

South Gate nearing completion.
At present handled by mechanical interlocker.

New System will replace pneumatic interlocker at Livingston Ave. in service since 1902.

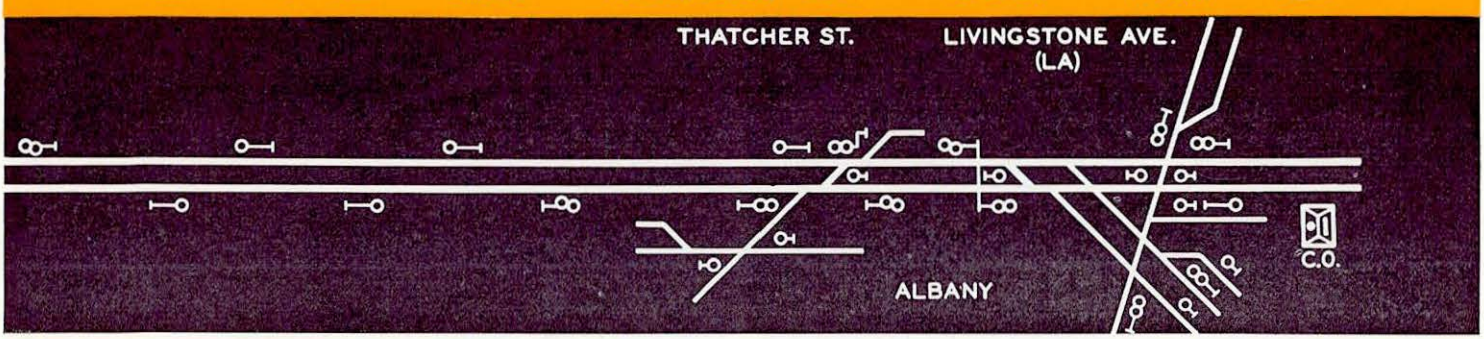


cTc Control Machine, Albany to Watervliet. This machine replaces 4 interlockings.

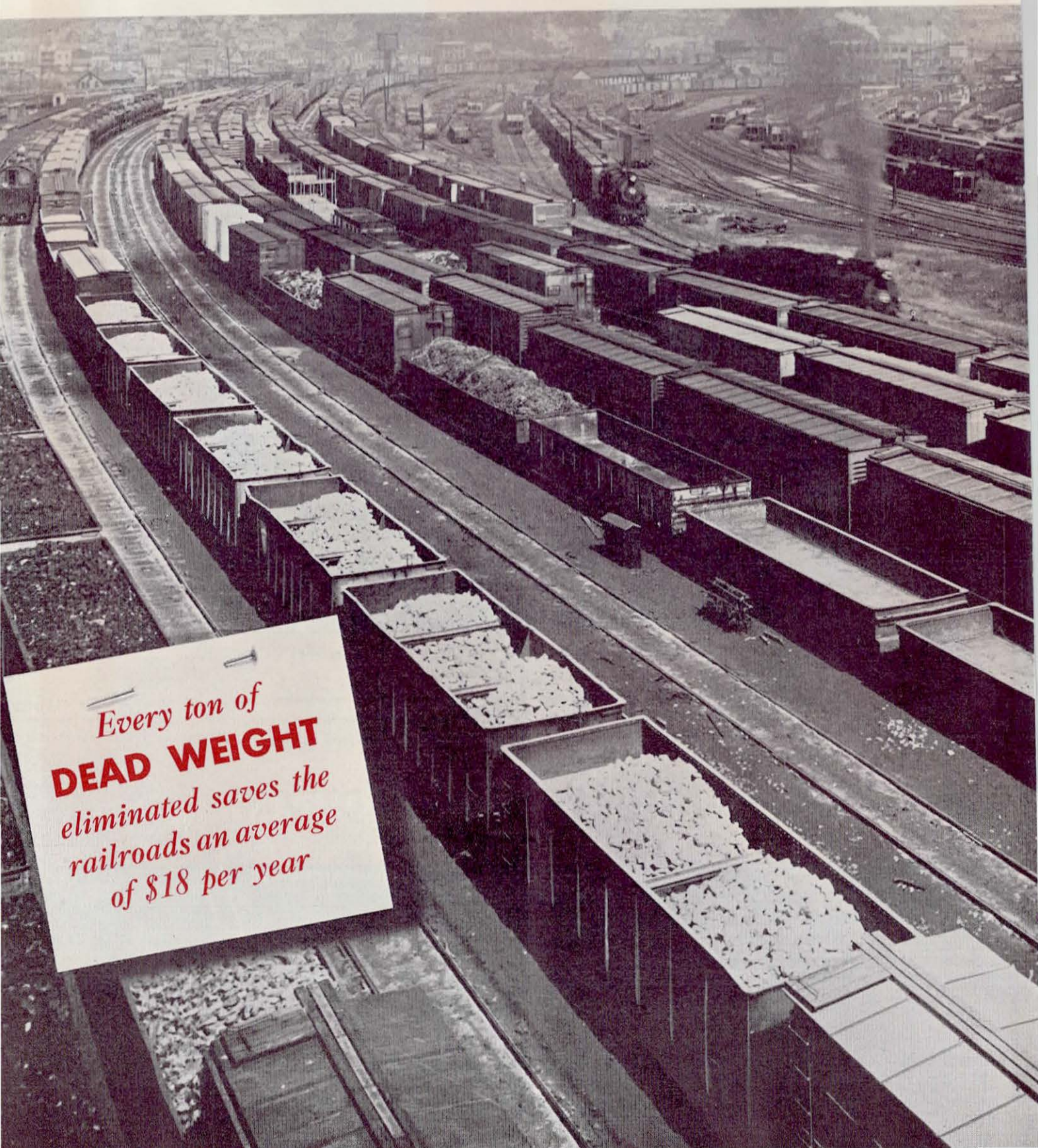
(1) 32 lever pneumatic interlocker
(2) 4 lever mechanical interlocker
3 lever table interlocker
(3) 40 lever mechanical interlocker
(4) 52 lever electric interlocker
Also several hand-operated switches.

GENERAL RAILWAY SIGNAL COMPANY

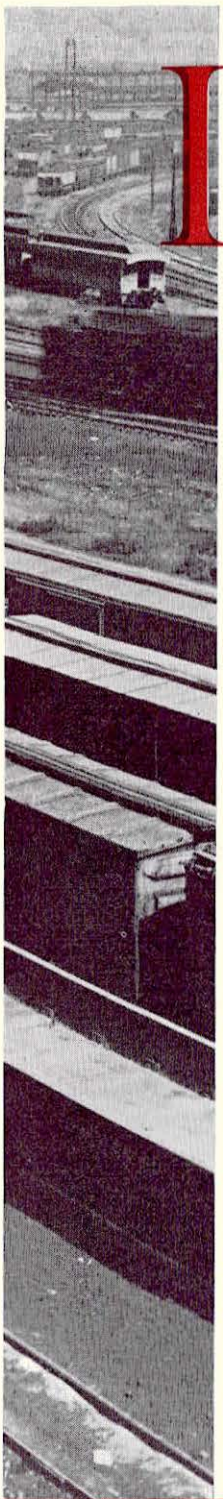
New York Chicago ROCHESTER, N. Y. St. Louis A-1361



In freight equipment . .



. . reduction of



Dead Weight

pays its biggest dividends

IT has been estimated that upwards of 100,000 new freight cars will be needed to take care of traffic requirements in 1937. Will these new cars continue to haul needless and costly dead weight?

Consider these facts:

According to conservative figures, the reduction of one ton of weight of a freight car would result in an average annual saving of approximately $18.

A five-ton conversion from dead-load to capacity for pay load in a 50-ton freight car would add about 8% to its revenue—with no increase in operating costs.

New freight cars built of USS COR-TEN and USS MAN-TEN, now in regular service, demonstrate that a 20% reduction in tare weight is easily possible and by no means the maximum that can be obtained.

Here is an indication of the operating savings made possible through light-weight construction employing USS High Tensile Steels — savings which would make your investment self-liquidating. It explains why during this year, these superior steels have been used in almost 25% of the new freight cars built.

If you would like the full story of the economies that USS COR-TEN and USS MAN-TEN construction makes possible . . . write to the Railroad Research Bureau, United States Steel Corporation Subsidiaries, Pittsburgh, Pennsylvania.

U·S·S HIGH TENSILE STEELS

AMERICAN STEEL & WIRE COMPANY, *Chicago and New York* · CARNEGIE-ILLINOIS STEEL CORPORATION, *Pittsburgh and Chicago* · COLUMBIA STEEL COMPANY, *San Francisco* · NATIONAL TUBE COMPANY, *Pittsburgh* · TENNESSEE COAL, IRON & RAILROAD COMPANY, *Birmingham* · COLUMBIA STEEL COMPANY, *San Francisco, Pacific Coast Distributors* · UNITED STATES STEEL PRODUCTS COMPANY, *New York, Export Distributors*

UNITED STATES STEEL

FOR A GOOD BOY OF 7 . . . OR 70

ON ALL THE RAILROADS OF THE UNITED STATES there are 2,126,863 cars and locomotives.

Between now and Christmas, upwards of 150,000 cars and locomotives, and some 316,000 feet of track for them will move out of Macy's.

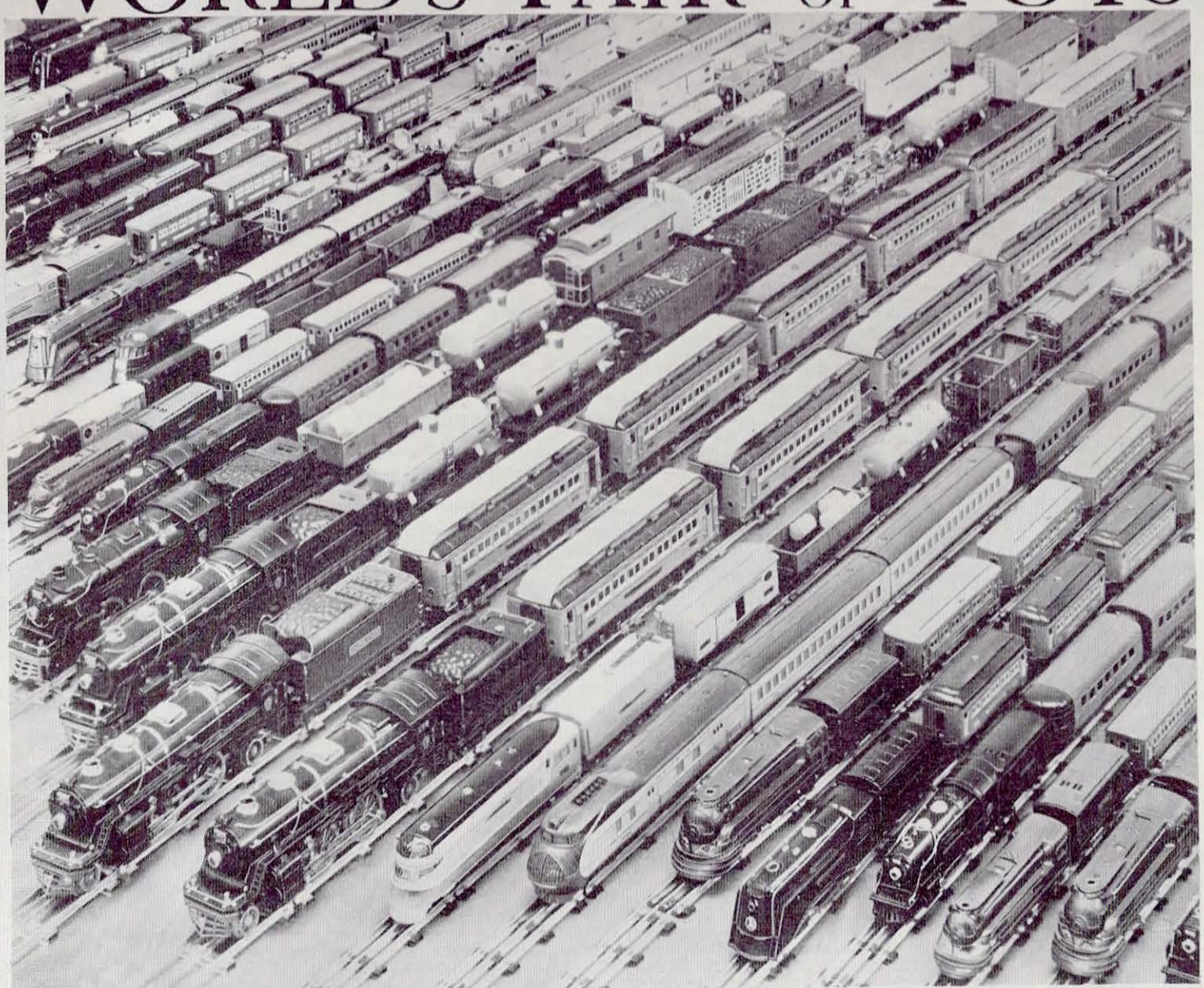
That seems like an awful lot of cars and locomotives.

It *is* an awful lot. It's enough to reward all the good boys of 7 (or 70) in New York for exceptional behavior.

But the quantity isn't a bit more important than the quality of them. They're not just trains—they're the best of the newest trains. And car for car, train for train, the chief thing that makes them exceptional is not only their design and construction, but their lowdown streamlined cash prices.

A whale of a lot of trains, to be sure. And yet, all of them total only a tenth of the number of amazing toys on Macy's fifth floor. That's why every boy of 7 (and 70) in New York is coming with proof of his good behavior to the . . . .

WORLD'S FAIR OF TOYS



MACY'S GIFT CENTRE U.S.A.

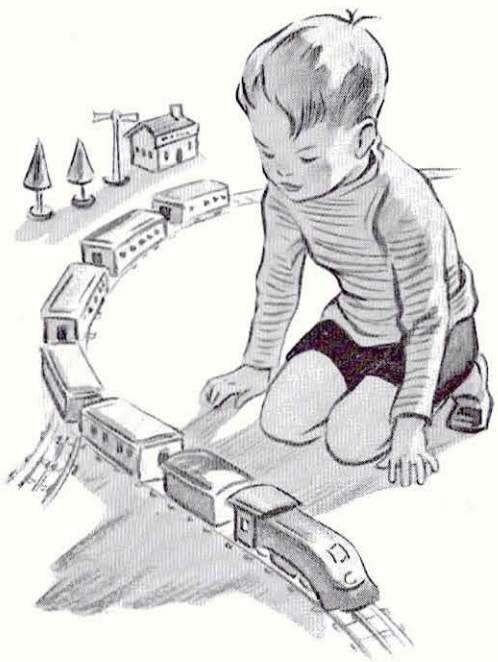
34th ST. & B'WAY . . . N.Y.C.

★ *We sell only for cash. Resulting economies including efficiency and volume save, we estimate, six per cent. We endeavor to have the prices of our merchandise reflect this saving, subject to limitations over which we have no control.*

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

THE BALDWIN LOCOMOTIVE

Take a Tip from the Little Fellows



Macy's says that thousands of new locomotives will be delivered to the little boys of America this Christmas.

These young railroaders know that their roads need new power and they are providing for this item in their requisitions on Santa Claus.

How about the real railroads?

Modern power, suitable for today's traffic, is the best present you could give *your* railroad right now...New locomotives assure immediate improvement in operation and earnings.

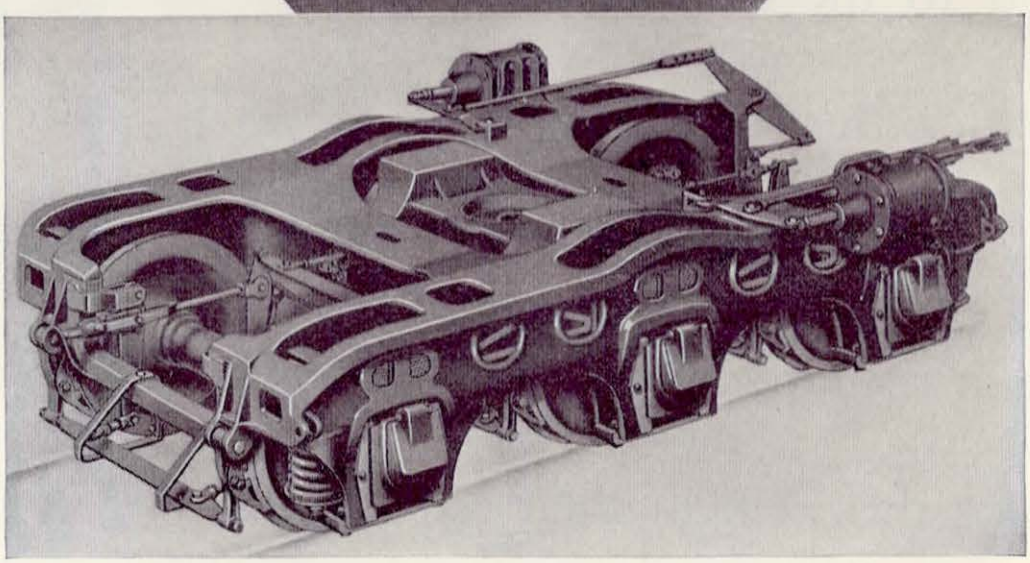
Opposite page reproduced by kind permission of R. H. Macy & Co.

WORKS • • • PHILADELPHIA

SWING MOTION-EQUALIZED

COMMONWEALTH SIX-WHEEL TENDER TRUCK

WITH BRAKE CYLINDERS MOUNTED ON TRUCK



The entire truck above journal boxes is spring-supported, reducing unsprung weight to a minimum with resulting reduction in track stresses.

The coil and semi-elliptic spring arrangement, with latest design of roller type equalizers, absorbs shocks quickly, properly distributes the loads on all wheels, and provides smooth riding tenders.

Simplicity of design permits Commonwealth Trucks to be assembled with minimum amount of work.

The design of truck also permits application of unit clasp brakes with brake cylinders mounted on truck.

Adequate openings in truck frame facilitate application and inspection of springs and equalizers.

•

GENERAL STEEL CAST

EDDYSTONE, PA.

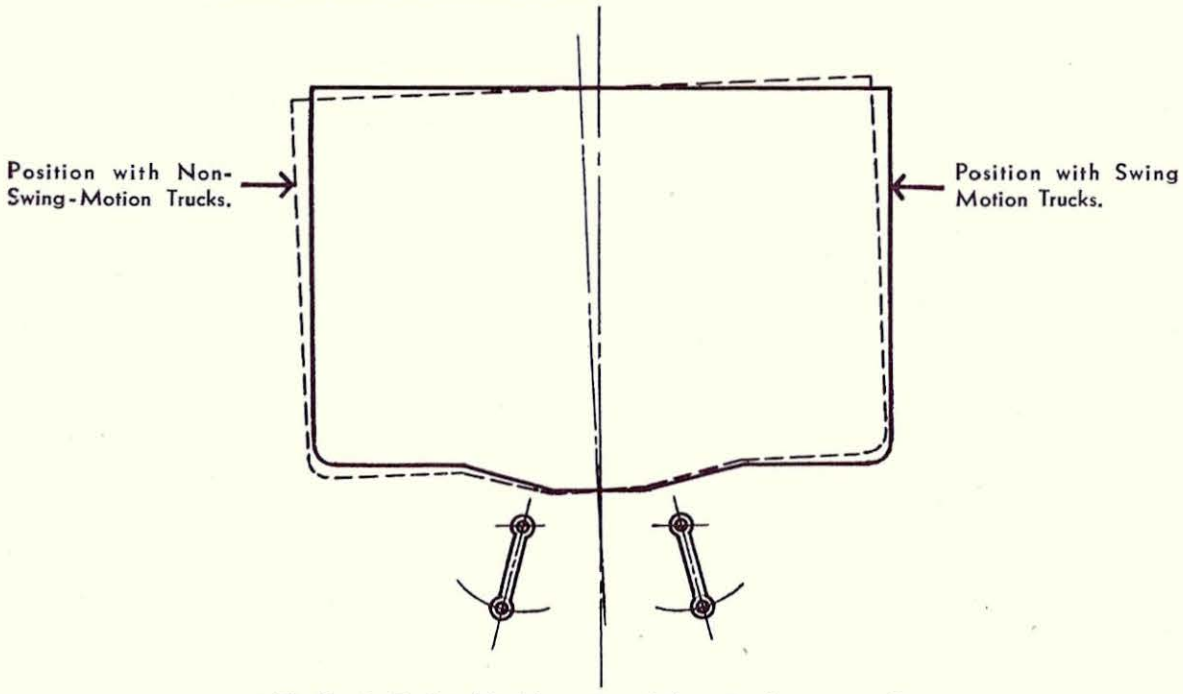
•• COMMONWEALTH

THE IMPORTANCE OF

Swing Motion

IN TENDER TRUCKS

The illustration below shows the relative positions taken by tenders, with Swing-Motion and Non-Swing-Motion Tender Trucks, when subjected to lateral forces.



The Tender Tank is lifted by action of the swing hangers on the side toward which the roll starts, overcoming the tilting of the tank.

The suspension of tender tank on converging swing hangers reduces the tendency of tank to heel over and permits higher train speeds on curves.

Swing motion reduces shifting of water and fuel loads and relieves the pressure on wheel flanges and rail.

With modern conditions of high speed service, and large capacity tenders, COMMONWEALTH SWING-MOTION TENDER TRUCKS are essential to easy riding and to the reduction of maintenance of both tender and roadbed.

•

INGS CORPORATION

PRODUCTS • • GRANITE CITY, ILL.

Reading and Lighting has a bearing on Passenger Comfort

TEN TO FOURTEEN INCHES is the distance of distinct vision for normal eyes. If your passengers must hold their newspapers closer than this in order to read at night, the car-lighting does not afford real comfort.

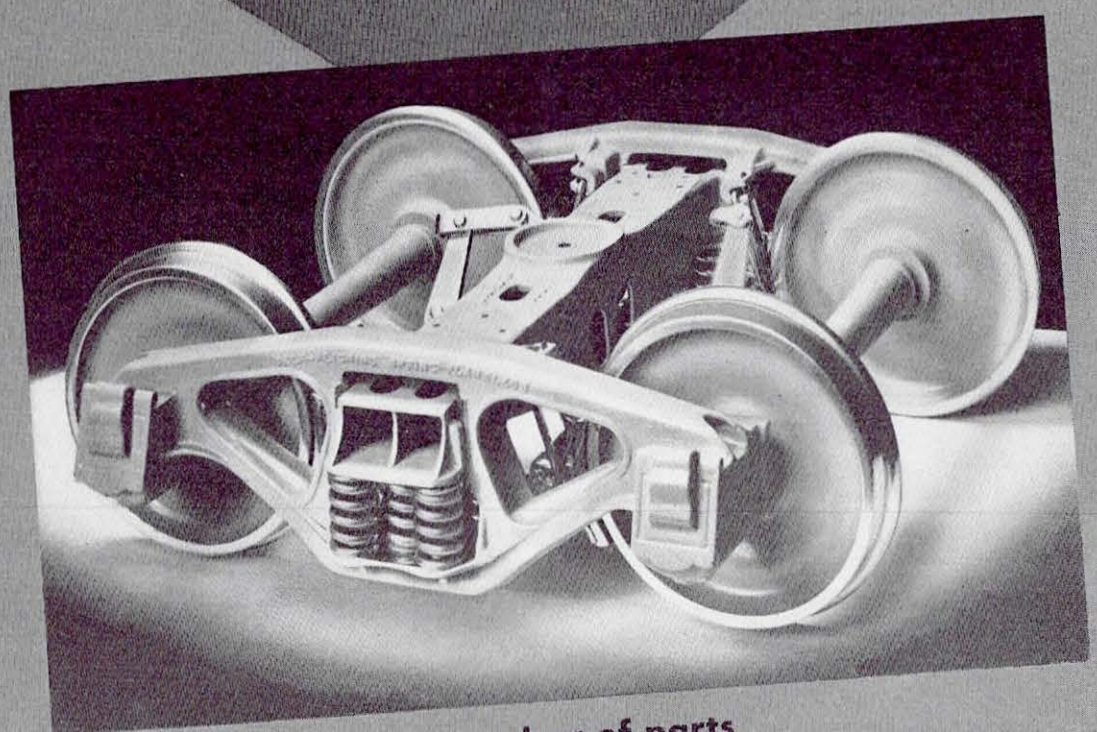
THIS simple "rule of thumb," based on accepted optical procedure, can quickly show whether your car-lighting contributes as it should to passenger comfort and satisfaction.

Nothing can go farther to assure steady, adequate light than the use of full-powered Exide-Ironclad Batteries. Exide-Ironclads maintain a good voltage throughout periods of discharge, even under excessive loads. As a result, the brilliance of the lights remains undimmed.

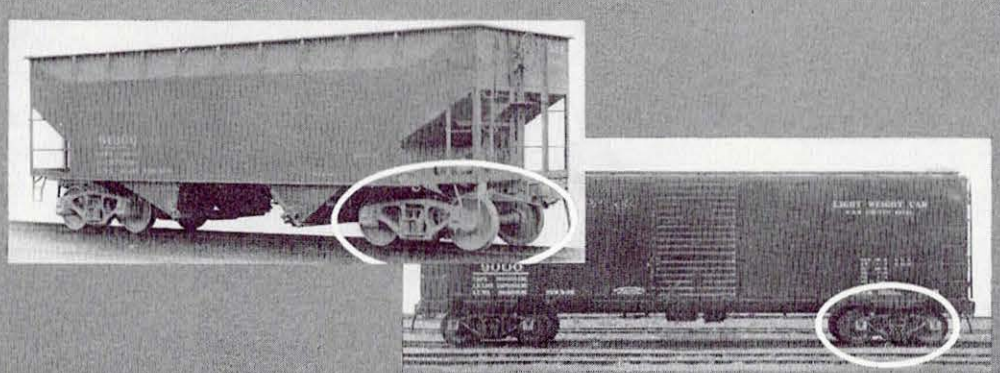
Exide-Ironclads, especially designed for the extra load of air-conditioning in addition to car-lighting, are playing their part in swelling passenger revenue by increasing the comfort and satisfaction of passengers on railroads throughout the nation. They improve car-lighting and air-conditioning service . . . and cut costs.

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia
The World's Largest Manufacturers of Storage Batteries for Every Purpose
Exide Batteries of Canada, Limited, Toronto

SELF-ALIGNING TRUCK
NO SPRING PLANK

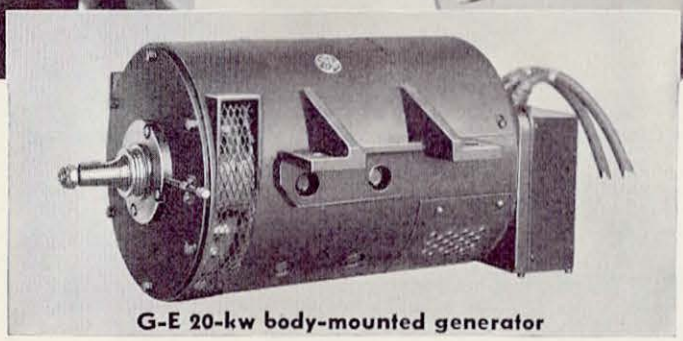


Minimum number of parts
Lowest initial cost
Lowest maintenance expense
Lightest weight
Wide choice of spring arrangement
Simple and easy to change springs
Quick wheel change



AMERICAN STEEL FOUNDRIES

NEW YORK CHICAGO ST. LOUIS



G-E 20-kw body-mounted generator

YOU MUST JUDGE

Air Conditioning by Its Performance

THAT'S the important consideration. Air conditioning isn't just a matter of installing equipment—as you know, of course. You want to be sure that the air in your cars is always conditioned. And that's where G-E equipment shows its dependability. It is designed and built by men who know their business—and the results prove how well they've done their job.

G-E generators have given millions of miles of service without a single burnout; they are an ample and reliable power supply for battery charging and lighting as well as air conditioning. The condensers are conservatively rated—with a capacity for cooling that more than meets modern standards. Order equipment now for next year's requirements, and specify complete G-E air conditioning. General Electric, Schenectady, New York.

285-8

GENERAL ELECTRIC

PERFORMANCE on thousands of miles of track, has proved the enduring value of AmCreCo products which, at minimum cost, provide durability, long term economy and profits in the form of low annual cost for track and structures. More than 30 years of leadership in the wood preserving field assure a high standard of uniform quality in AmCreCo ties, poles, piles and timbers.

AMERICAN CREOSOTING COMPANY

INCORPORATED

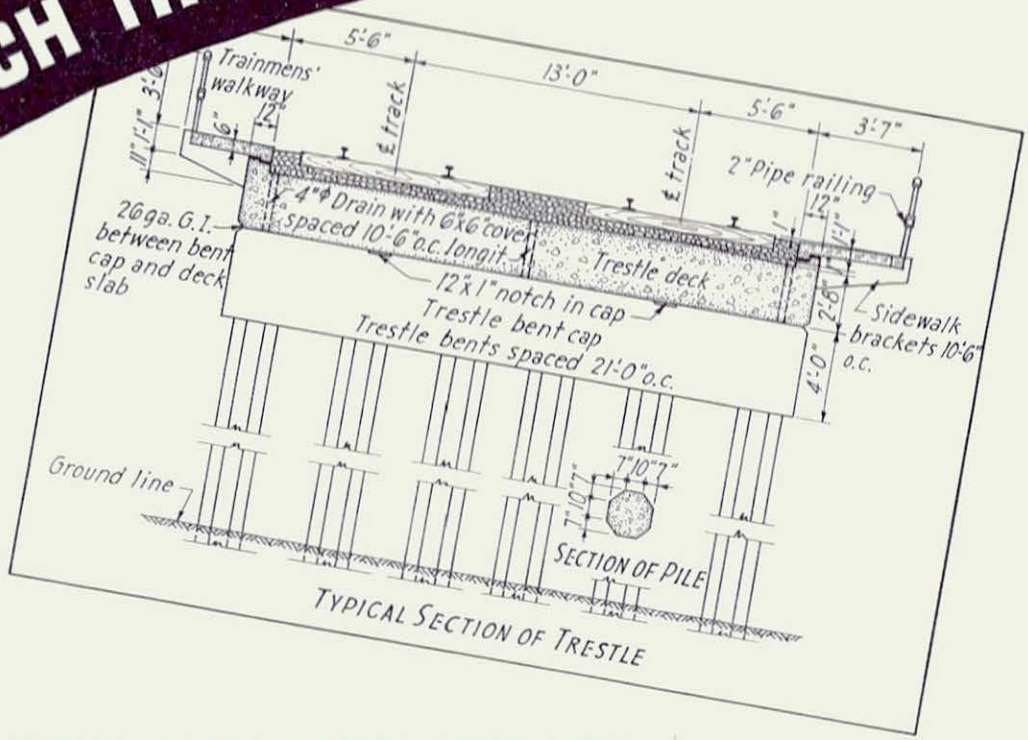
COLONIAL CREOSOTING COMPANY
INCORPORATED

AMCRECO
LOWRY PROCESS CREOSOTED WOOD

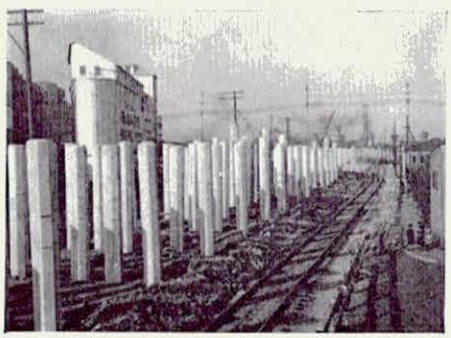
GEORGIA CREOSOTING COMPANY
INCORPORATED

ADDRESS INQUIRIES TO CHICAGO, ILL., OR LOUISVILLE, KY.

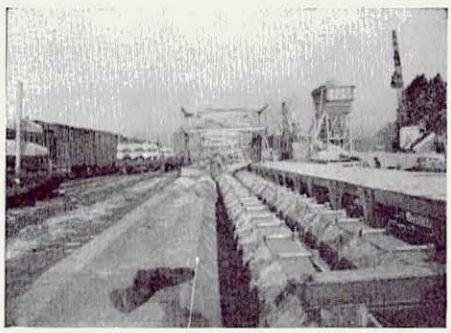
WATCH THIS JOB AT LOUISVILLE!



... where BIG CONCRETE PILES are showing a faster and more economical way to build track elevations and trestles!



Nearly 1500 concrete piles being used in Louisville.



Scene at casting yard showing two piles just cast and two steam curing under tarpaulins. G. R. Smiley, Chief Engineer of the L. & N. PWA project under direction of Kentucky Dept. of Highways, T. H. Cutler, State Highway Engineer; Wallace W. Sanders, Dist. Engineer. General contractor, Henry Bickel Co., Louisville. Pile manufacture and driving by Western Foundation Co., Chicago.

Use of 24-inch reinforced concrete piles, six per double-track bent, is a feature of the mile-long track elevation program of the Louisville and Nashville Railroad through Louisville.

Large concrete piles were chosen here because:

LOW MANUFACTURING COSTS per foot of pile—through application of modern methods including wet steam curing for winter work.

RAPID DRIVING—several bents per day easily driven and caps and deck construction can follow immediately.

SAFETY against fire—unique with concrete.

HIGH RESERVE STRENGTH—large-pile bents have ample stiffness and resistance to breaking stresses for heights up to 30 ft. without bracing, and much greater heights with bracing. Each 24-inch pile has triple the load capacity of an ordinary pile.

LONG LIFE with minimum maintenance and depreciation.

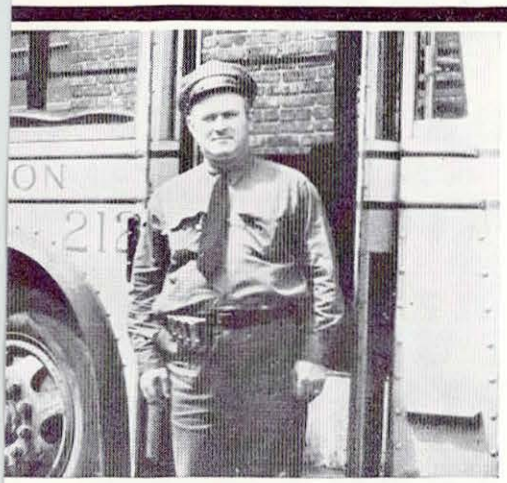
LOWEST COST per foot of completed trestle, *and lowest annual cost*, of any comparable construction.

Write for information sheets on design, manufacture and driving of large concrete piles, and economies of concrete pile trestles.

PORTLAND CEMENT ASSOCIATION
Dept. A12c-26, 33 W. Grand Ave., Chicago, Ill.

ACTUAL USERS

TELL YOU SOVAC OILS SAVE THEM MONEY



READ THESE FACTS:

"20% LESS GAS"

(Left) Tompkins Bus Corp., Staten Island, N. Y.

Sovac Oils made this astonishing saving over a period of 22 months.

"NO SLUDGE"

(Right) Lynn Sand & Stone Co., Swampscott, Mass.

Sovac Oils reduced operating costs 5% on this fleet of 20 trucks.

"30% LESS OIL"

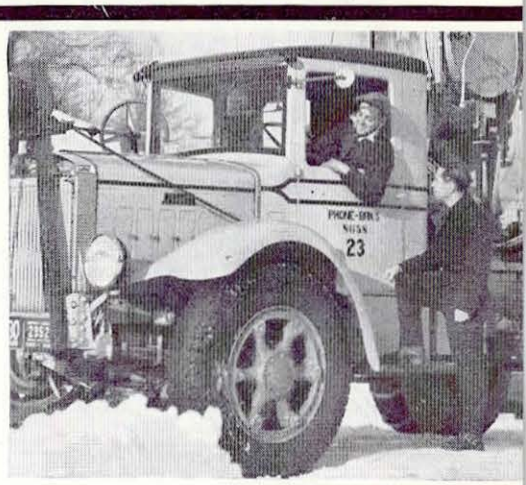
(Left) The Only Way Transfer & Warehouse Co., Kansas City, Mo.

The 14 trucks in this fleet earned bigger profits after changing to Sovac.

"REPAIRS CUT 66%"

(Right) H. J. Albright, Coxsackie, N. Y.

Sovac Oils used over a year in this urban and inter-urban 13 bus fleet.



These operators, too, were amazed that such a money-saving oil is on the market

SOVAC OILS are made by the makers of Mobiloils. All that science and modern refining can devise goes into their manufacture by the Clearosol Process. This makes them pure, tough and long lasting.

These heavy-duty oils are ideal for use on motorized equipment operated by railroads, including trucks, buses, rail motor cars, shop and power house equipment.

Correct lubrication on motorized equipment affects railroad operating costs in many different ways. It lessens the amount of equipment out of service. Reduces repairs. Gives longer life to all equipment. Minimizes inventories of spare parts held in Stores Department for unexpected needs.

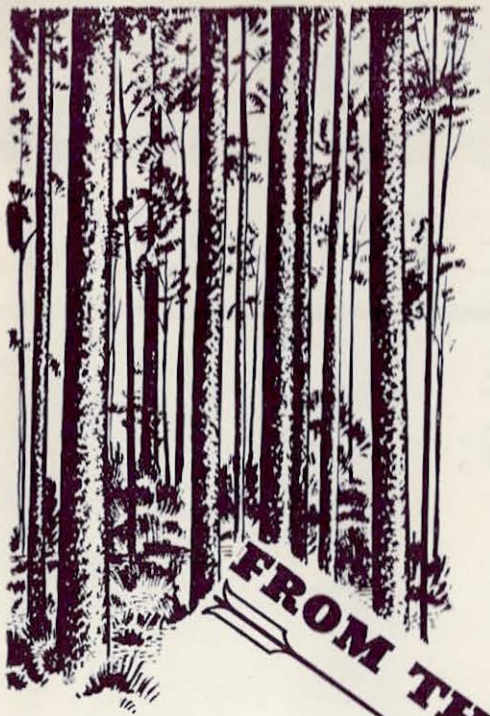
Socony-Vacuum provides nation-wide engineering service with men trained to cooperate with railroad personnel. Write to Socony-Vacuum Oil Company, Inc., Railroad Division, 26 Broadway, New York City; 59 E. Van Buren Street, Chicago; or any affiliated company.

GARGOYLE Lubricants

SOCONY-VACUUM OIL CO.

INCORPORATED

STANDARD OIL OF NEW YORK DIVISION · WHITE STAR DIVISION · LUBRITE DIVISION · WHITE EAGLE DIVISION
WADHAMS OIL COMPANY · MAGNOLIA PETROLEUM COMPANY · GENERAL PETROLEUM CORPORATION OF CALIFORNIA



A complete service

BASED ON

42 years

OF CONTINUOUS

EXPERIENCE

PROGRESS

CO-OPERATION

RESEARCH

FROM THE TREE TO THE JOB

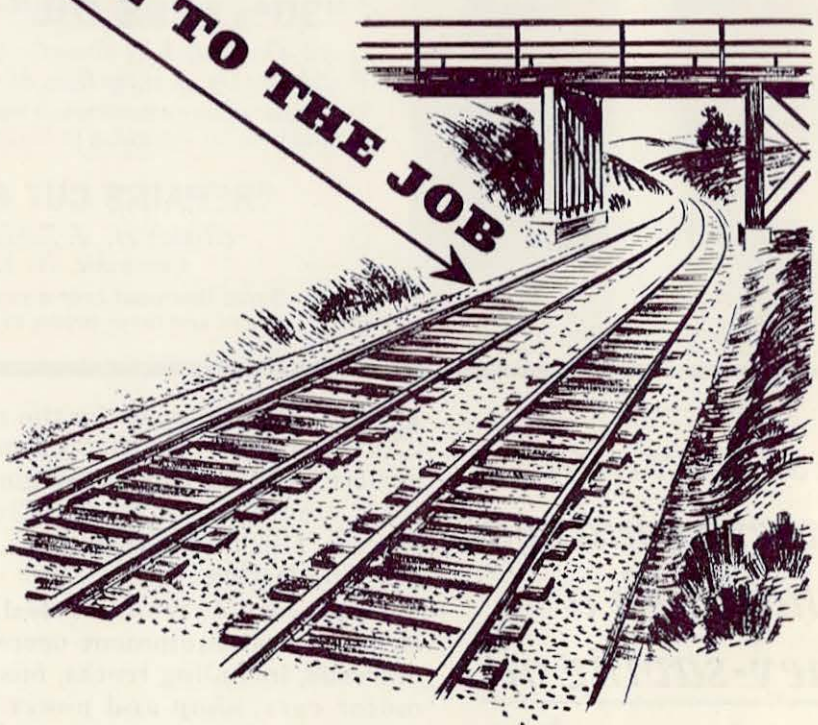
PRESSURE TREATED

CROSS TIES

LUMBER

PILING

POLES



THE WOOD PRESERVING CORPORATION
KOPPERS

THE WOOD PRESERVING CORPORATION

KOPPERS BUILDING . . . PITTSBURGH, PENNA.

SALES OFFICES

Baltimore, Md.
Boston, Mass.
Charleston, S. C.
Chicago, Ill.
Denver, Colorado
Houston, Texas
Kansas City, Mo.
Memphis, Tenn.

AYER & LORD DIVISION CHICAGO, ILL.

CENTURY DIVISION PITTSBURGH, PA.

CAROLINA WOOD PRESERVING CO. CHARLESTON, S. C.

NATIONAL LUMBER & CREOSOTING CO. TEXARKANA, ARK-TEX.

SALES OFFICES

Montgomery, Ala.
New York, N. Y.
Philadelphia, Pa.
Pittsburgh, Pa.
Reed City, Mich.
St. Louis, Mo.
Superior, Wis.
Texarkana, Ark.

Nicholson Thermic

SYPHONS ORDERED

January 1 to November 30, 1936

300 LOCOMOTIVES

(new and existing)

including new locomotives on the following railroads:

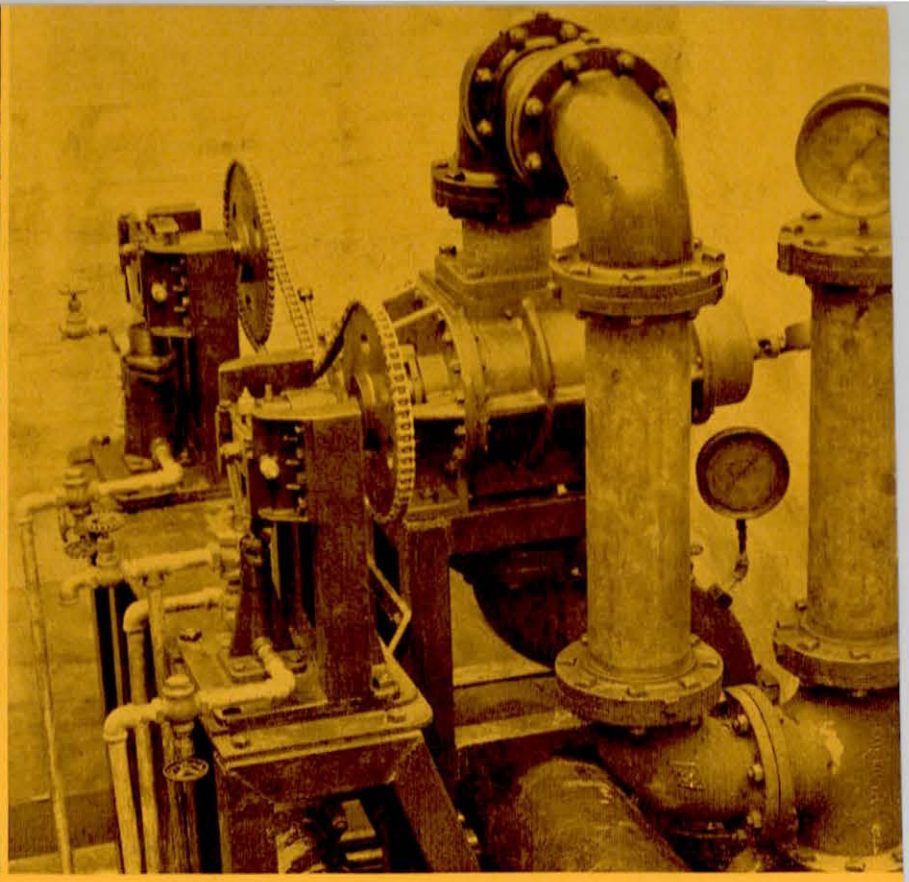
Atchison, Topeka & Santa Fe Railway
Aliquippa & Southern Railroad Company
Alton & Southern Railroad
Bessemer & Lake Erie Railroad Company
Boston & Maine Railroad
Chicago, Milwaukee, St. Paul & Pacific Railroad Company
Conemaugh & Blacklick Railroad Company
Detroit & Toledo Shore Line Railroad Company
Lehigh & New England Railroad
Louisiana & Arkansas Railway Company
New York, New Haven & Hartford Railroad Company
Northern Pacific Railway Company
Richmond, Fredericksburg & Potomac Railroad Company
Toledo, Peoria & Western Railroad
Union Railroad Company

Austrian State Railways
National Railways of Mexico
Royal Siamese State Railways
Peruvian Corporation
Central Railway of Brazil

16,280 Syphons have been installed in 7,418 Locomotives on 163 Railroads

LOCOMOTIVE FIREBOX COMPANY

NEW YORK CHICAGO MONTREAL



For the Demands of Modern Train Service

AIDING the railroads in their splendid winning fight for faster freight and passenger travel, Dearborn Engineers and Chemists are correcting water supplies with increasing scientific precision.

Dearborn Methods include surveys of water supplies and operating conditions, planning and installing automatic proportioning equipment, furnishing the correct Dearborn Treating Materials and Dearborn Laboratory Control Service. Concentration tests are made periodically and locomotives blown according to the requirements shown.

Dearborn methods are saving railroads thousands of dollars annually.

Dearborn Engineers will cooperate with you on any water problem.

Dearborn
TRADE MARK REGISTERED

DEARBORN CHEMICAL COMPANY
310 S. Michigan Avenue, Chicago
205 East 42nd St., New York
2454 Dundas St., W., Toronto

BANTAM
DOES THEIR PART
to Break the Record

THE engine of the record holding Denver Zephyr uses Bantam Quill Bearings.

In producing the power plant for this famous train, Electro Motive Corporation chose only the finest material—the kind that can stand up and help win world records.

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"WORLD'S GREATEST TRAVEL SYSTEM"

Upholsters Canada's Newest Trains With . . .

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It's Velmo, of course! Its proven dependability for transportation seating—its modern smartness of design and color . . . make Velmo Mohair Velvet the practically *inevitable* upholstery choice for this streamlined era.

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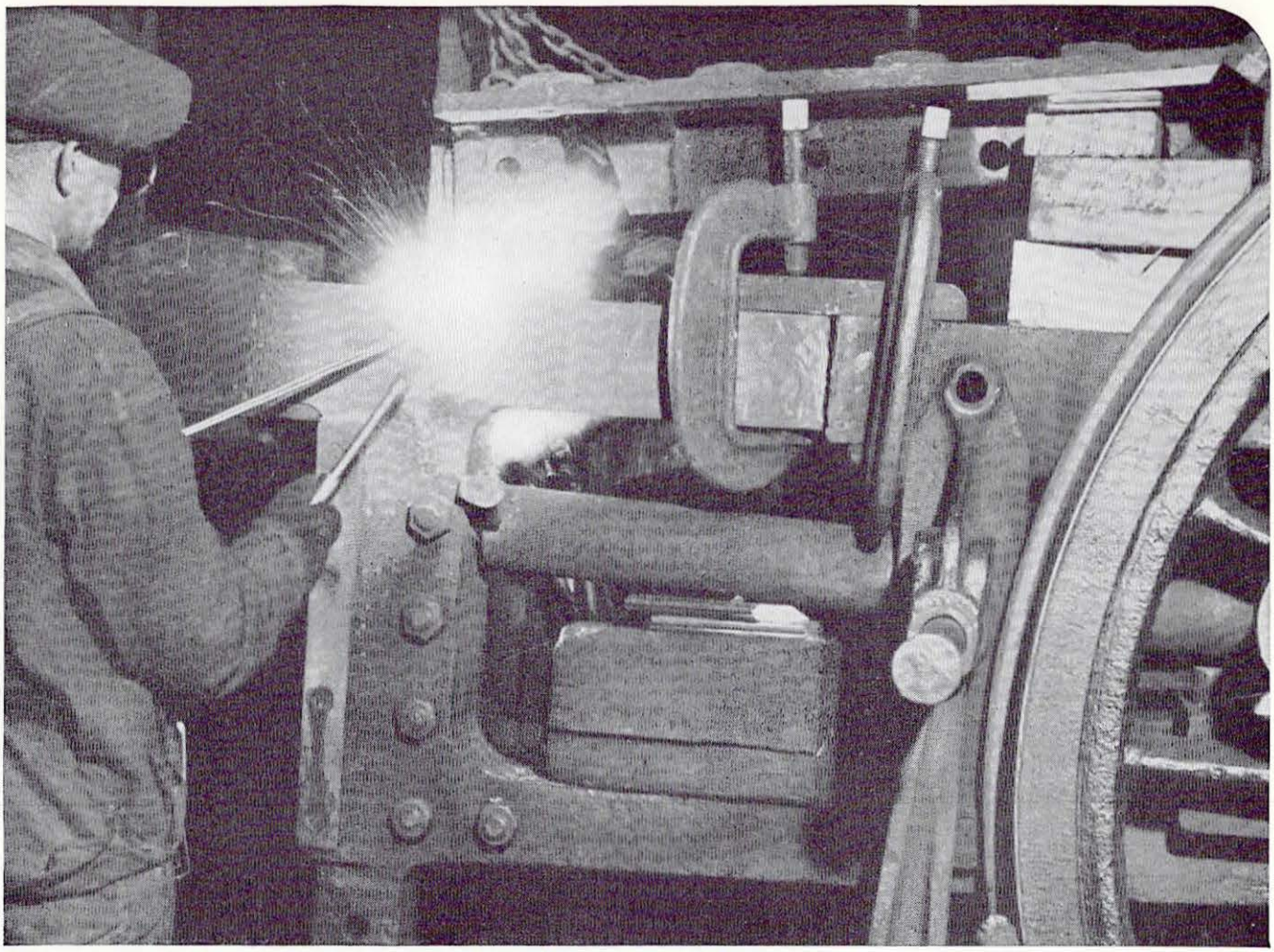
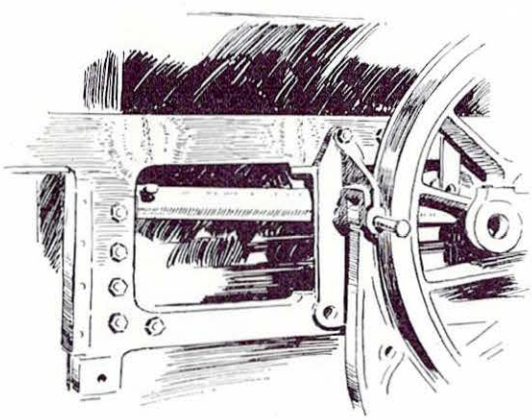


OXWELD *locomotive frame repairs*
ARE HIGH IN QUALITY—LOW IN COST



A locomotive frame, repaired by welding under Oxweld procedures.

The introduction of new high-efficiency welding apparatus and quality welding rods has increased the savings which can be made in oxy-acetylene welding broken or cracked locomotive frames.

The Oxweld procedure for this operation is economical and should be considered for all locomotives shopped for frame repair.

With this and similar solutions to railroad welding problems, The Oxweld Railroad Service Company has served the welding and cutting needs of a majority of the Class I railroads through almost a quarter of a century.

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SAVE BY *Evaporative Cooling*

with Sturtevant Spray Type Units!

Studies made of 1464 weather observations from Los Angeles to Boston during June, July, August and September show...

345 periods (23.5%) when ice or freon would *not* be necessary... periods when evaporative cooling could provide all the air conditioning needed.

Sturtevant Railvane Spray Type Air Conditioning Units, designed for ice chilled water or freon, and evaporative cooling, provide savings in operating costs. On severely hot days the water sprays, chilled by ice or freon, produce air conditioning and dehumidify the air like any well-known system... and in addition, cleanse the air by thoroughly washing it. In mild, dry, dusty weather the sprays operate without ice or freon to freshen and cool the cars with 100% washed outside air... by the well-known principle of evaporative cooling.

The Sturtevant Railvane Spray Type Air Conditioning Unit:

1. Cools, dehumidifies, filters, washes and distributes the air... in the summer time.
2. Heats, humidifies, filters and distributes the air... in the winter time.
3. Air from passenger compartment is actually passed through a deluge of highly atomized chilled water discharged from spray nozzles.
4. Air is "mellowed" to the proper coolness and humidity... preventing "shock" to passengers coming from hot, humid outside atmosphere.
5. Uniform air distribution is assured by Sturtevant-designed single or double air duct or by use of directional streamline louvres.

Interior of one of the new Canadian Pacific Semi-streamlined Jubilee Coaches . . . equipped with Sturtevant "Railvane" Spray Type Air Conditioning Unit. See the Sturtevant-designed overhead air distributing duct. Air is discharged from this duct along the entire length of the car. It gently diffuses with the air at passenger level, producing a pleasing circulation. ¶ Cooling medium is chilled water secured from meltage of ice stored beneath each car in Sturtevant-designed ice storage bunkers. ¶ A total of four Canadian Pacific Semi-streamlined Jubilee Trains . . . operating between Montreal and Quebec, Calgary and Edmonton, and Detroit and Toronto, are equipped with these units. Each train consists of one baggage and buffet car and two first-class coaches.

Let us send you full information regarding this important Sturtevant development in railway air conditioning. Or ask our nearest engineer to call. He has all the facts and will gladly cooperate with you.

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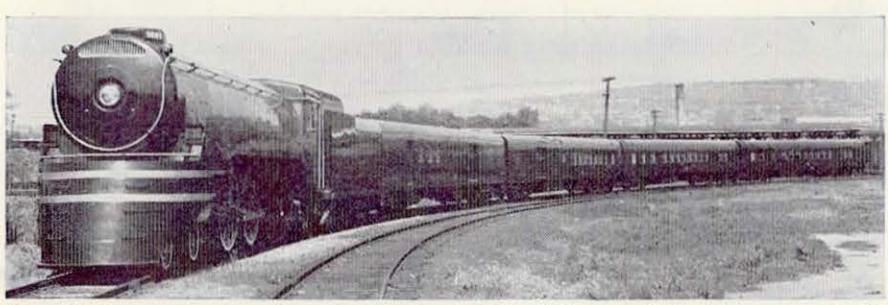

One of the four new and already famous Canadian Pacific Jubilee Trains . . . all of which are equipped with Sturtevant "Railvane" Spray Type Air Conditioning Units.

Sturtevant RAIL VANE TRADE MARK UNITS OR SYSTEMS

are used by 37 railroads. "Railvane" Air Conditioning is protected by 25 basic issued patents and other patents pending.

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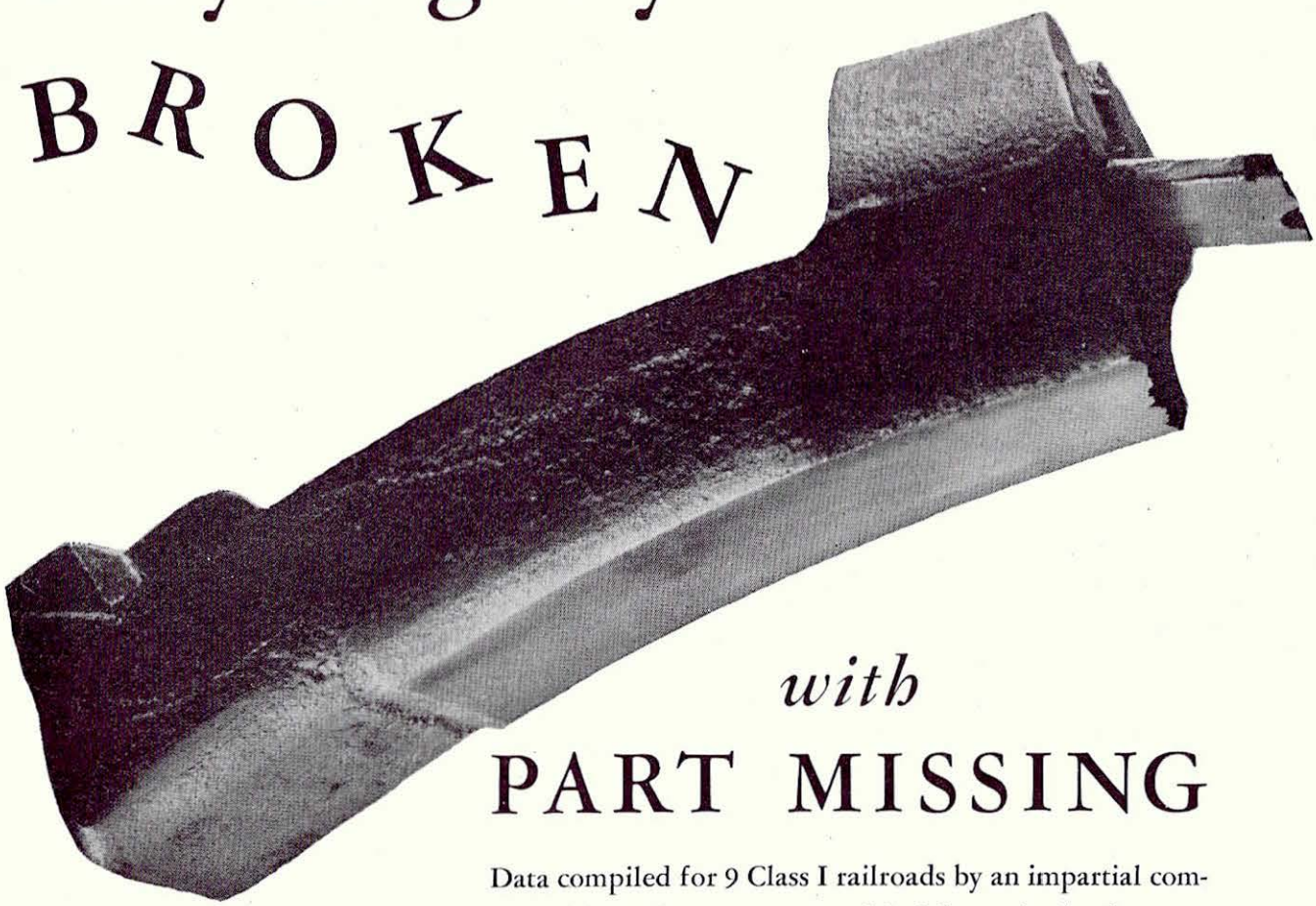
Only Slightly Worn *but*—

BROKEN



with

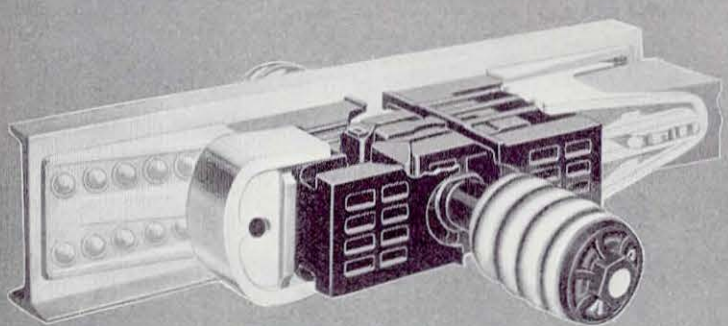
PART MISSING

Data compiled for 9 Class I railroads by an impartial committee show that 53 per cent of freight car brake shoes are removed because they are broken with part missing while they are still on the average 1″ thick.

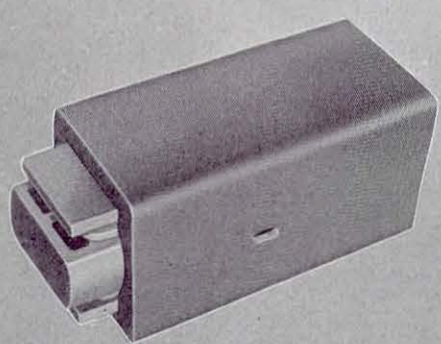
This record is bad, of course, but an even worse condition is the large number of shoes that are discarded because they are broken with part missing when they are *but slightly worn.* The new Duplane reinforced shoe (A.A.R. Alternate Standard) answers the broken shoe problem.

If you are not already acquainted with this important improvement in brake shoe construction ask our representative to tell you about it—it is an answer to the A.A.R.'s statement that an improvement in brake shoe design is *necessary.*

THE AMERICAN BRAKE SHOE AND FOUNDRY COMPANY



CARDWELL FRICTION
DRAFT GEAR
Type L-25-SA



CARDWELL WESTINGHOUSE
FRICTION DRAFT GEAR
Type NZ-11-E

CARDWELL FRICTION

BOLSTER SPRING

CARDWELL WESTINGHOUSE CO., CHICAGO

CANADIAN CARDWELL CO., LTD., MONTREAL

Railroad Jim
THE COLUMN CONDUCTOR Says . . .

I was down in the freight yard the other day. One of those square miles of tracks, freight cars, switch engines and men.

•

Every man there had a grin on his face. Every man there was doing his darndest to get those cars where they were going as quick as possible. Every man there took it as his own personal responsibility that the cars he handled, or the detail he took care of, was a personal service to the shipper and the consignee. I want to tell you it was inspiring.

•

You want to know what caused all this? What has brought about all the improvement and energy in Western Railroads? I'll tell you what it is. It is PUBLIC APPRECIATION.

•

Throughout the whole vast network of Western Railroads they have cut hours off of freight schedules—had to do it to keep out of the way of faster passenger service. But shippers and consignees said "Thank You." The public showed appreciation. And now watch what's going to happen next year.

Why, say, don't you know that air-conditioning of passenger cars was just an experiment until public appreciation gave the glad hand to Western Railroads? Don't you know that better food and lower prices in dining cars and eating stations was nothing but added expense until the public showed its appreciation? Don't you realize that the tremendous program of improvement in coaches and standard sleeping cars, the new streamlined trains, the speeding up all along the line was the direct result of public appreciation?

•

What has made it possible to reduce fares to the lowest point in railroad history? What has made it possible for Western Railroads to offer summer round-trip excursion fares throughout this winter? Public appreciation of previous fare reductions.

•

"Travel by train" is getting to be a national slogan. "Ship by train" is equally popular. Western Railroads are out to make a haulage record in 1937. They are going after more of that same public appreciation which has every railroad man, from president down to track walker, doing his best to earn it.

. . . Railroad Jim

WESTERN RAILROADS

and THE PULLMAN COMPANY

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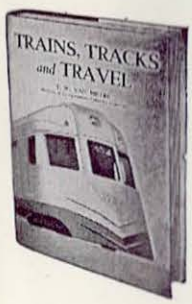
New Fourth Edition
Trains, Tracks and Travel

By T. W. VAN METRE

Professor of Transportation, Columbia University



The new edition of this popular book on railroads describes latest practice. There is a complete new chapter on streamlined trains and additions to others covering the new developments in air brakes, air conditioning of passenger cars and in high-speed Diesel and electric locomotives. Among the numerous new illustrations are shown the new streamlined trains. This is an excellent book for a boy who wants to know more about railroads and for the average reader.

Contents

Our Steam Railroads—The Railroad Track—The Steam Locomotive—Electric Locomotives; Gasoline and Oil Motors—Freight Cars—Passenger Train Cars—Tomorrow's Trains Become Today's—Passenger Stations and Terminals—The Operation of Trains.

1936. 4th. 312 pages, 276 illus., 7 x 9½ in., cloth, $3.00

Analysis of Railroad Operations

By J. L. WHITE

Formerly Assistant Comptroller, United States Railroad Administration; Director, Section of Transportation Service—Federal Co-ordinator of Transportation

Without going into the details of accounting procedure, Mr. White clearly explains the accepted method of analyzing and interpreting railroad statistical data. He describes how the figures produced in accounting departments should be used in the study of railroad operating results; how these figures reflect the various activities of the railroad and its efficient or inefficient operation as a whole or in any of its departments.

Classifications of the Interstate Commerce Commission are shown in full and frequent references are made to them in the main text.

1925. 391 pages, forms, index, work sheet, and the Jan. 1, 1935, order of the I. C. C., 6 x 9 inches, cloth. $4.00

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( ) Analysis of Railroad Operations
( ) Who's Who in Railroading
( ) Regulation of Railroad Finance
( ) When Railroads Were New
( ) Transportation Glossary

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State .....
Company .....
Position .....

(This offer is limited to the United States and Canada) R.A. 12-19-36

Regulation of Railroad Finance

By JOHN H. FREDERICK, Ph. D., FRANK T. HYPPS, Ph. D., and JAMES M. HERRING, Ph. D., *Wharton School of Finance and Commerce, University of Pennsylvania.*

The regulation of the financial affairs of railroads by the Federal government through the Interstate Commerce Commission, under the Transportation Act of 1920, is herein clearly explained. Various tests applied by the Commission in determining the elements of public interest to which the statute usually refers are traced, together with the nature and reasons for the Commission's action.

1930. 237 pages, tables, index, 6 x 9 inches, cloth, $3.50

When Railroads Were New

By CHARLES FREDERICK CARTER

A fascinating human interest story of the early American and Canadian railroads and of the men who built and ran them. The author, an old railroad man, tells of the beginnings of the Erie, the Pennsylvania, the Baltimore and Ohio, the New York Central, the first Pacific railroad, the Santa Fe, the Rio Grande, the Canadian Pacific and other lines. It is illustrated with reproduction of wood cuts of early locomotives and railroad scenes.

1926. 4th (Centenary). 338 pages, 17 illustrations, 6 x 9 inches, cloth. $2.50

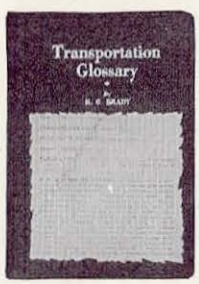
Who's Who in Railroading

The 9th Edition of what was formerly the "Biographical Directory of Railway Officials of America" is based upon a complete resurvey of the field by means of original questionnaires. Biographical sketches of some 4,000 railroad officials, equipment manufacturers, economists, members of regulatory commissions and others whose work is directly connected with the railroad industry of North America are presented. The descriptions of these leaders of the rail industry include personal information, such as their family connections and social, religious and political affiliations, as well as a complete outline of their professional careers.

1930. 579 pages, 6 x 9 x 1⅝ inches, cloth. $3.00

Transportation Glossary

By H. G. BRADY



Technical and semi-technical terms, phrases and expressions in more common use in railway, highway, air and marine transportation, and in port traffic are concisely defined in this handy reference book. Ordinary dictionaries, thesauri and law book sources furnish little information on transportation terms and this book fills a long felt need. It is printed in large clear type and cross references facilitate quick tracing of desired information.

1929. 119 pages, 5 x 7 inches, flexible. $1.75

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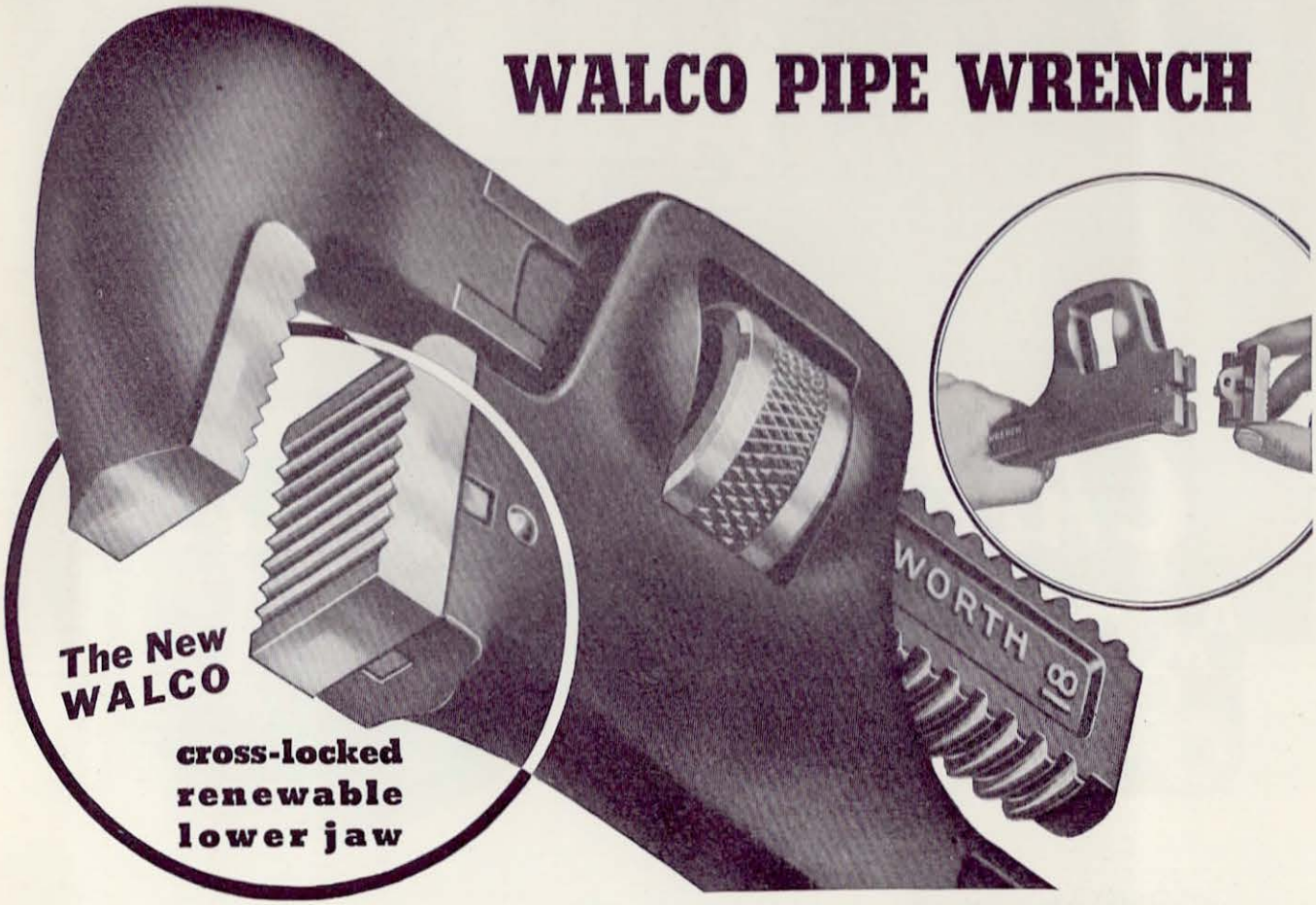
BUILT FOR LONG SERVICE...

WALCO PIPE WRENCH



The Walco Wrench is built for heavy duty. Its life is practically indefinite, for the part on which wear focuses—the teeth on the lower jaw—is renewable. New lower jaws, made of specially-hardened steel, can be inserted in place in a few minutes.

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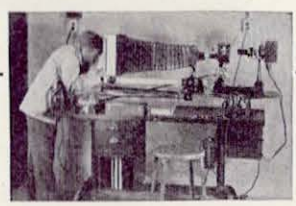
Walco—strongest made and longest lived—in the long run will save you the most money.



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Railway Age

With which are incorporated the Railway Review, the Railroad Gazette and the Railway Age-Gazette. Name registered U. S. Patent Office.

Vol. 101 December 19, 1936 No. 25

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Modern Interlocking at Syracuse 904

Tells of New York Central installation using the centralized control-type interlocking machine with miniature type non-interlocking levers.

Pennsylvania Railroad Destroying 32,000 Freight Cars 911

Part I of a two-part survey of this largest equipment-junking program on record, which has increased operations at the world's largest railway scrap yard.

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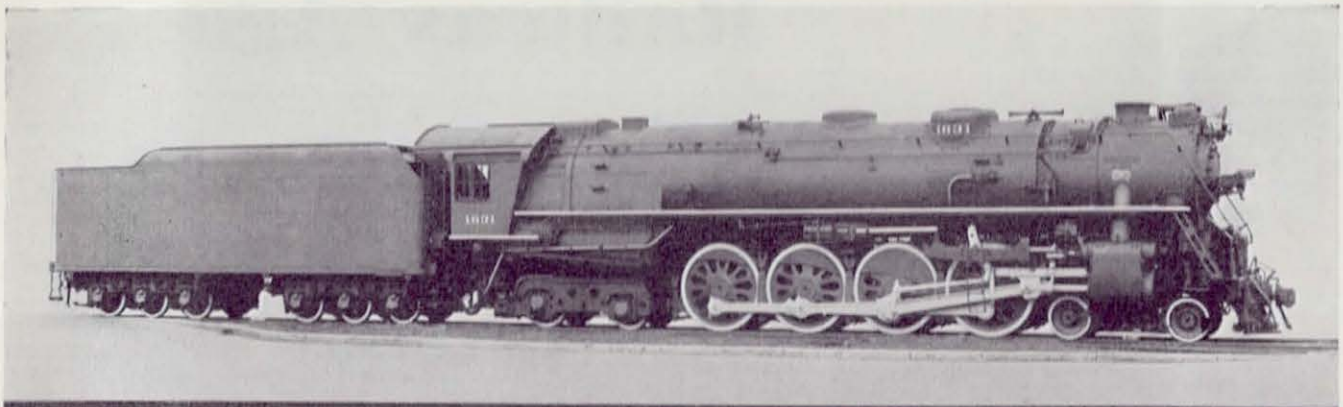
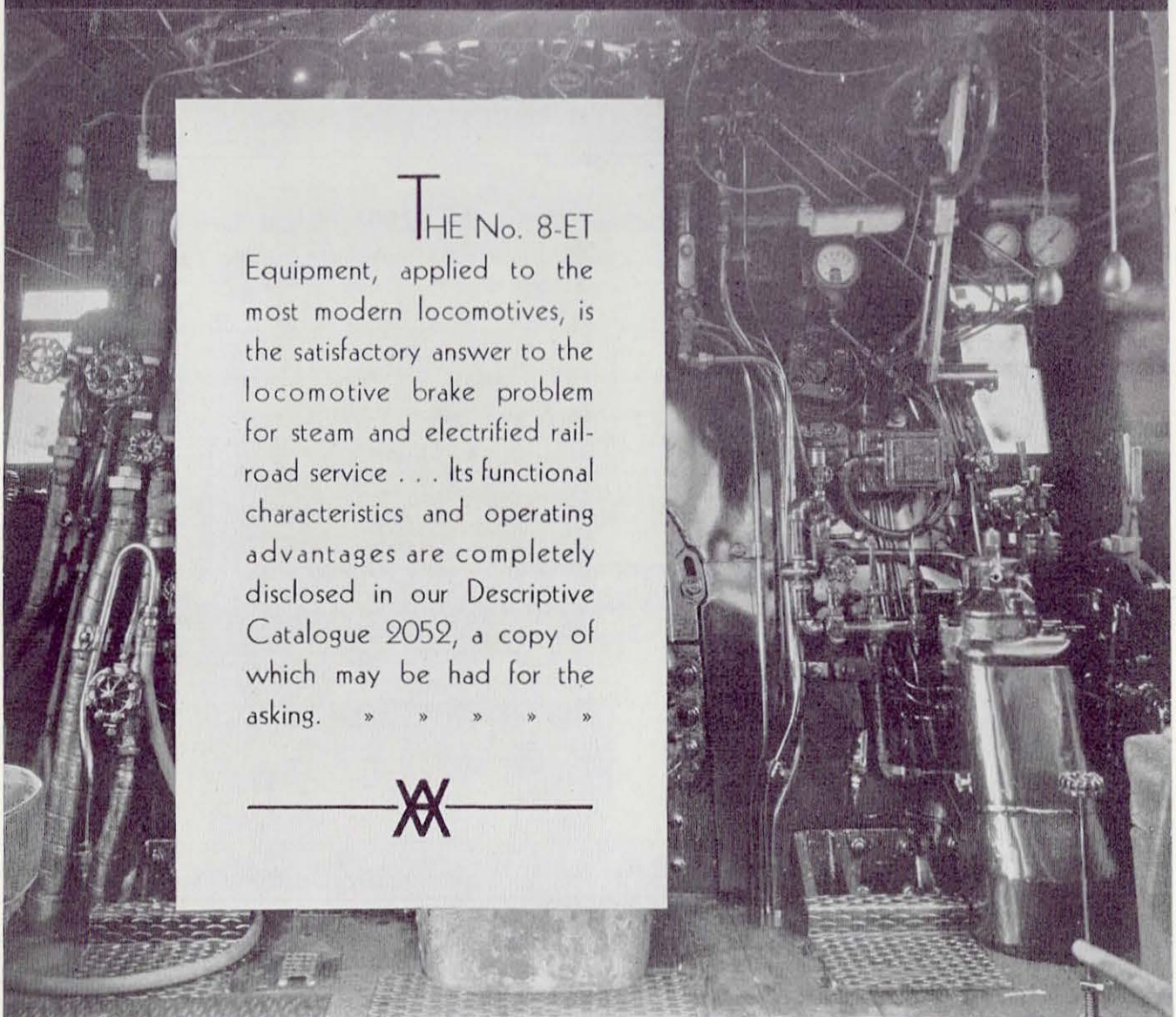
The Railway Age is indexed by the Industrial Arts Index and also by the Engineering Index Service



MODERN LOCOMOTIVES Need This Modern Brake—the No. 8-ET Equipment



THE No. 8-ET Equipment, applied to the most modern locomotives, is the satisfactory answer to the locomotive brake problem for steam and electrified railroad service . . . Its functional characteristics and operating advantages are completely disclosed in our Descriptive Catalogue 2052, a copy of which may be had for the asking. » » » » »

WESTINGHOUSE AIR BRAKE CO.

GENERAL OFFICE AND WORKS . . . WILMERDING, PA.

The Week at a Glance

DESTROYS 32,000 CARS: The Pennsy is actively engaged in cracking up 13 per cent of its freight cars to get rid of obsolete and costly rolling stock—a large and important project, and carefully planned, described elsewhere herein.

●

LOREE LEAVES K. C. S.: Leonor F. Loree, who has been associated with Kansas City Southern for more than 30 years, on Wednesday retired both as board member and chairman. The company's affairs being in "very satisfactory shape," he wishes to have more leisure, and to devote himself more intensively to other interests.

●

NOVEMBER EARNINGS: Preliminary figures issued by the A. A. R. from roads having 85 per cent of total operating revenues show a revenue increase of 17.7 per cent over November last year, but a reduction of almost 10 per cent under November, 1930. Freight revenues were up 18.8 per cent over last year and passenger revenues 14.8 per cent. In the East, where heavy reductions in passenger rates were made, the increase in passenger revenues in November over last year was only 13.3 per cent, whereas the increase in freight revenue was 20.2 per cent.

●

CARLOADINGS: Total for the December 5 week was 745 thousand which was almost 17 per cent above last year and was a tiny fraction of one per cent above 1930.

●

HIGH SPEED 4-6-6-4: Described with illustrations herein is the new Union Pacific single expansion 4-6-6-4 for hauling heavy freight trains over the mountains at high speeds. There were 15 of these engines in the order.

●

GAS INTO DIESEL: A Brill gasoline rail car has been converted to Diesel operation for service in Cuba; mechanical transmission retained. Car weighs 30 tons and its 150 hp. motor is designed to pull also a 25-ton trailer.

●

OZARK ZEPHYR: One of the four-car Burlington Zephyrs, recently replaced by larger "twins" on the Chicago-St. Paul run, will be placed in daily round-trip service between St. Louis and Kansas City on the Alton-Burlington joint route—279 miles, 5½ hours, 50.7 m. p. h. including several intermediate stops; name "Ozark State Zephyr."

●

BARGAIN FREIGHT RATES: At the I. C. C. hearing this week on the proposed temporary continuation of the freight rate surcharges, Commissioner Eastman commented on the effect of reduced passenger fares, apparently toying with the thought that reduced freight rates might be as attractive of traffic as reduced fares have been. But is there a true analogy here? A passenger journey is a complete service, and a reduced rate should stimulate travel, whereas a freight rate is but a part of the total cost of laying down a commodity where it can be used. Reduced freight rates could not stimulate traffic unless the cost of commodities at points of consumption were thereby reduced. Are the shippers who are seeking lower freight rates also striving with equal zeal to reduce the prices of their products to the public? That is the test of their sincerity—and also of whether reduced freight rates would be likely to increase traffic.

●

WAR PLANS: Legislation will be introduced to provide for industrial mobilization in the event of war. Transport agencies would be operated by their own leaders, but there would be a *Price Control Commission* "to maintain a proper balance between commodity prices, utility *rates, and wages.*"

●

BEST PAID WANT MORE: Train and engine service employees, whose hourly earnings have already reached levels far above those of most other employees by reason of increased train speeds, are not satisfied, and seek to raise their differential still higher. An editorial herein discusses the brotherhoods' decision to demand a wage increase, and shows what these employees are now receiving—and how much of it is for hours not worked.

●

SYRACUSE SIGNALS: There will be no delays chargeable to old-fashioned interlocking to trains passing through the New York Central's new passenger terminal at Syracuse. When the trains quit running through the streets at Syracuse, their movements came under the control of an all-electric installation, described herein, which embodies the latest refinements of the signaling art. The plant has no mechanical locking whatever, and another interesting feature is the "hands off" light.

●

WHEELER PROBE: The Montana Senator is keeping himself in the spotlight at the finance hearing, developing his side of the case for the benefit of the newspapers. Witnesses "for the defense" on Tuesday—according to the account of the hearing elsewhere in this issue—were not permitted to state their case at the inquiry, which the Senator promised last week was to be "objective." Well, at that, there are two meanings of "objective"; and one of them is a synonum for purposive.

●

EDUCATION: Railroad men used to acquire a "journeyman's" education in their jobs by working for several roads. They can no longer do that, and adequate training for most positions is not now readily available. Schooling in salesmanship for traffic department employees is obviously an urgent need. The leading editorial herein points out that the time to set educational qualifications is when men are being hired, or before they are promoted—that is, during a period of employment expansion *such as is occurring right now.*

USE FOR OLD RAILS: Central of Georgia has arc-welded scrap rails to make a frame for a pier shed at Savannah—thereby saving both money and time on a hurry-up job. Details in an article elsewhere in this issue.

●

SNOW TRAIN JR.; New Haven will have an innovation in its snow train service this winter, a "Snow Train Junior" for youngsters, 5-16, which will operate Saturdays from New York to Canaan, Conn., hauling the lads and lassies at half the usual excursion rate, or at less than ½ cent per mile. Numerous regular week-end snow trains, at bargain excursion rates, have been announced by several roads, including New York Central, Pennsylvania, Long Island, Erie, Lackawanna, and Lehigh Valley.

●

HOW PUBLIC JUDGES: According to Chairman W. Averell Harriman of Union Pacific, writing in the current number of Forbes Magazine, the public judges the efficiency and alertness of railway organizations almost solely by the character of their passenger service. The road which neglects this service because there may be little money in it thus invites a low opinion of its efficiency in general. Since U. P. began improving its service and reducing its rates (to an average of only 1.7 cents a mile including Pullman passengers) it has not only gained greatly in public esteem but has increased its passenger revenues 66 per cent as well.

●

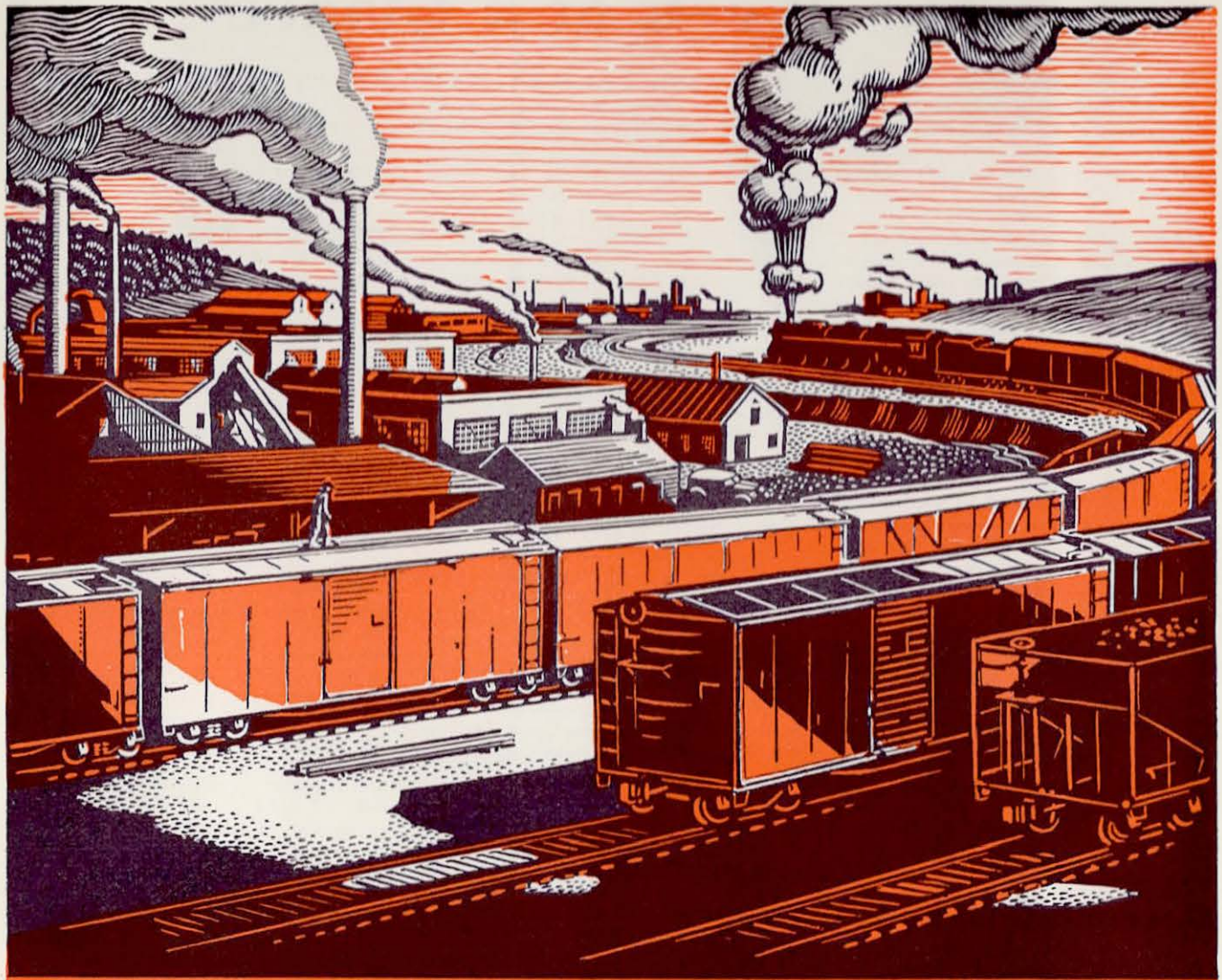
XMAS PARTY: New York Central will operate again this year a Christmas Party Special from New York to Pittsfield, in the Berkshires, for the benefit of persons unable to celebrate the festival with their families. A ticket, at less than $5, will include a 300-mile train ride, dinner at Pittsfield, and a variety of entertainment, both on and off the train.

●

BEAM IN THE EYE: Business accuses the politicians of demagoguery, but who gives the demagogues their ammunition? The financial legerdemain now being revealed by the Wheeler committee is no reflection on actual railway managers, an editorial herein points out; nor it is primarily a reflection on the politicians making the exposure. Financiers, accredited as leaders in railroads and Big Business, built the structure now being uncovered—and Big Business in general, and the railroad business in particular, will get blamed for what they did.

●

WALSH-HEALEY ACT: This law shows why every company which sells anything to the railroads ought to be supporting all measures which will preserve railway credit and thus prevent government ownership. This act gives the government control over hours, wages and working conditions of all concerns selling anything to the government. Under its provisions, government ownership of the railways would extend such control to all concerns selling anything to the railroads.



Dragging Brakes Due To Leaky Train Pipe Soon Cost More Than The Pipe Itself

Pitting is one of the most frequent causes of replacement of train-line piping—and the hardest to combat. » » » The piping is fastened in place with clamps; under several coats of paint; and hard to get at—inspection is almost impossible. Until leaks cause dragging brakes, pitting often goes unnoticed. » » » Toncan Iron Pipe, an alloy of open hearth iron, copper and molybdenum, is highly resistant to corrosion. While slightly higher in first cost, its longer life makes its cost-per-year-of-service lower than that of ordinary pipe. » » » In train-line piping Toncan Iron guarantees maximum economy of service, dependability of performance and minimum idle car hours for replacements. » » » Address Department RA. for further information. » » »

REPUBLIC STEEL

Republic Steel CORPORATION

GENERAL OFFICES: CLEVELAND, OHIO

REPUBLIC BOLTS NUTS and RIVETS and similar staples are made with the same care and high quality of material as are the familiar Republic railroad specialties.

RAILWAY AGE

The Key to Further Progress Lies in Personnel Policies

It is evident that of the many tasks facing railroad managements that of the selection of new personnel, and the training and education of employees and supervisory officers, will assume far greater importance in the years ahead than at any time since the world war. It is a well-known fact that the average age of railroad employees, due to the operation of the seniority law during a long period of retrenchment, is comparatively high. Consequently, personnel changes due to retirement are bound to be unusually large in the next ten years or so. That fact alone would make necessary greater attention to personnel and training programs than has been accorded to them in the recent past.

Salesmanship Training Needed

But there are other aspects of the situation which likewise point to the necessity for intensification of effort along these lines. One is the almost total lack of any formal education heretofore in the fundamentals of salesmanship of passenger and freight sales staffs, coupled with developments which make skilled salesmanship a vital necessity in the traffic department. Lately some of the roads have, rather sporadically, provided courses of lectures for their soliciting staff—but it is obvious that the volume of such effort which can be expected on the part of men who have already "arrived," so to speak, is definitely limited, whereas salesmanship training in any degree desirable may be required of entering employees.

The final solution of railroad sales and merchandising problems lies in fitness and educational tests for all new traffic department employees; and the requirement of continued study along these lines as a prerequisite to advancement in traffic department work. Railroad employment is, comparatively, attractive and well paid. There are plenty of young men and women available who have the aptitude and the training necessary for salesmanship of a high type; and who would be willing to continue their studies in night and correspondence schools and otherwise. Is it not obvious that every road, as vacancies occur, should resolutely restrict itself to engaging only those who will meet the highest aptitude and educational qualifications?

There have long existed correspondence and other courses for the development of rate experts and many traffic employees have taken such courses and benefited by them. Without disparaging such educational efforts, it is perhaps worth while to note that traffic departments need real salesmen perhaps even more than they need rate experts. A few rate experts can serve a lot of customers, but a salesman is needed behind every ticket window and behind the counter and at the phone in every freight house.

Revival of Apprentice Training

As for the mechanical crafts, it is evident that unless training programs are extended and intensified, there will develop before any great length of time a real shortage of competent workmen. A few railways have recognized this and have set up apprenticeship and training plans to correct the situation. But, certainly the movement in this direction is as yet far from general; so that, even in the one department where really adequate formal training has ever been general on the railways, the present situation is, at best, spotty. Railway mechanical work—not only in the shops, but in all the technical departments—requires a skill of its own which cannot be acquired outside the railroad industry. It is certain, therefore, that training programs to develop employees with the required skill cannot with safety be much longer delayed.

For operating department employees and clerks few roads have ever provided any formal training. These employees have learned the tasks assigned to them, and have had to rely for the most part entirely upon their own initiative for locating educational material and facilities which would improve their capacities. In the days before the war when employees moved with comparative ease from road to road, an operating department employee had the opportunity at least to know how a particular job was performed on several different railroads. Today, even such a limited educational opportunity as that has largely disappeared. And there is a great need to provide by books or lectures the knowledge of comparative methods which can be no longer gained by direct experience.

Two or three roads are trying to meet this need by arranging courses of lectures where leading officers in each department set forth the principles which dominate the practice in that department—so that the best method of doing each particular job may become the common

knowledge of all who have that job to do. Moreover, by attending such lectures, employees of one department secure a better understanding of the work of other departments, which is a most important result. In a departmentalized industry such as a railroad, the temptation always exists to put loyalty to a department ahead of that to the industry itself. We all know such departmental enthusiasts, who care little how the railroad runs provided their particular activity can make a good showing.

Opportunity for Railroad Clubs

Some of the railroad and traffic clubs throughout the country have carried on programs of more or less educational value, but these have been largely of the "hit or miss" variety, and not a sustained stimulus—with the possible exception of the recent efforts in this direction of the Pacific Railway Club, which do appear to be logically developed and inclined to call forth some sustained effort by participants. The railroad clubs throughout the country could probably serve a most useful function if they would intensify their educational programs. They cannot hope to do so effectively, however, if their primary concern is to be the social contacts they provide for the older members; instead they will have to do something definitely to interest the younger employees.

Railway managements are frequently exhorted to display more "statesmanship." By this word the exhorter usually means taking some wild gamble in the matter of policy which, if it failed, would probably cost the manager his job and might bring serious financial difficulties to his company. But statesmanship—genuine statesmanship—can be brought to bear on the matter of employment, training and education without risk to the statesman, and with the certainty that his efforts will prove fruitful to his company, to his company's employees and to society as a whole.

Statesmanship With No Risks Involved

The personnel of the railroad industry will undergo radical changes in the next ten or fifteen years. The railroad being a human institution, it is in the power of those who direct railroad employment and training policies during the next decade to determine what the future of the railroad industry is to be—whether it will fumble along with haphazard and lackadaisical employees, whose training is left to chance; or whether, on the other hand, by a wise selection of entrants and provision for thorough and continuous training in their work, the railways will by the strength of their personnel display renewed virility among the industries of the country.

Aptitude tests and continuation studies for all entrants; apprenticeship courses for technical departments; professional courses for rate men and accountants; lecture courses for operating department employees and clerks; continued safety and courtesy education of all employees; citizenship courses—including transportation economics and public speaking—available to all qualified employees: These would appear to be the minima of the arrangements by which the railroads can utilize the inevitable turnover in their personnel as a means of assuring the ascendency of the industry in the period that lies ahead. A few leaders have already seen the opportunity and are acting upon it. Should not the whole industry respond to the opportunity?

The railways are paying for the best in personnel. Is it not sound business for them to continue to get what they are paying for? And are they likely to do so under haphazard methods, leaving everything to chance?

Those That Have Want More

Press reports from Cleveland to the effect that train and engine service employees will meet shortly after the first of the year to formulate demands for increased wages prompt some inquiry into the present earnings of these employees. In the first nine months of this year—the latest period for which information is now available—the 221,837 train and engine service employees on the Class I railways received an average of $1,750.56 in wages, an increase of seven per cent over their corresponding earnings a year ago. Traffic increases in the past three months indicate that the average earnings of these men for the entire year 1936 will approximate $2,400.

In the first nine months of the year the average number of train and engine service employees rose from 205,220 in 1935 to 221,837 in 1936, a gain of eight per cent. At the same time, the total wages paid to these men jumped from $336,000,000 in the first nine months of 1935 to $388,000,000 in the same period of 1936, an increase of more than 15 per cent. In other words, the relative increase in wages was about twice as great as the relative increase in employment.

The favored position among railroad workers enjoyed by train and engine service employees has been discussed in these columns at various times. As further evidence of this favored position, the current figures of the Interstate Commerce Commission show that in the first nine months of 1936 the average train and engine service employee was paid for 1,533 straight-time hours actually worked; for 322 straight-time hours not worked; for 114 overtime hours; and for 53 hours in the form of constructive allowances, making a total of 2,022 hours actually paid for. Of these hours paid for, however, straight time actually worked plus overtime paid for amounted to only 1,647 hours. At the average nine-month earnings per employee of $1,750.56, this means an average wage slightly in excess of $1.06 per hour actually worked.

In acquiring these total earnings of $1,750.56 in the first nine months of 1936, the average train and engine service employee received $1,300.90 for straight time actually worked; $272.38 for straight time paid for but

not worked; $135.12 for overtime; and $42.16 in constructive allowances. These figures average $194.51 per month for a working month of approximately 23 days, or about $8.50 for each eight hours worked.

The Van Sweringen Case

The Van Sweringen case very unhappily illustrates both how some practices of Big Business help to undermine the system of capitalism and, in particular, to undermine public confidence in private ownership and management of railways.

The Van Sweringens employed some of the ablest railway men in the country to manage the railways they controlled, and these railways have been efficiently managed and have rendered good service. There is no evidence or intimation that the financial structure through which control was secured ever caused any railway man to be unemployed, any difference in wages or rates, or any difference in service.

The facts disclosed which are doing harm to the entire railroad industry by the widespread publicity being given to them are entirely financial. And almost every example of management that has brought the industry into disrepute has been an example of financial management. The Van Sweringens sought and secured control of a vast railroad system with a comparatively small investment of their own capital by the creation of a series of holding companies.

This method of financing was open to at least two criticisms. (1) The Interstate Commerce Commission had by law been given the authority and duty of regulating the issuance of railway securities. The creation of these holding companies constituted a lawful evasion, but nevertheless an evasion, of the purpose of this legislation to have the volume of securities issued representing railway properties controlled by government. (2) The railways in question were mainly owned by many thousands of investors who, by the creation of the series of holding companies, had control of the management of their properties centralized in the hands of persons whose direct and indirect investment was only a small fraction of the total investment that the properties represented. Whether this resulted in actual abuses harmful to the large majority of the security holders of these railways, to their employees or to the public is not the important point. The important point is that it did afford opportunity for serious abuses, and therefore was bad financing and tended inevitably to create a bad public sentiment.

The entire case illustrates how men, in an effort unduly to increase their wealth and power, may and often do disregard probable consequences that may be ruinous to themselves and extremely damaging to the economic system which affords them opportunity to acquire wealth and power legitimately. The Van Sweringens merely did on a large scale what financiers in other industries did in a period of frenzied financing. The facts and alleged facts are now being broadcast at the worst possible time for the railroad industry and the entire system of capitalism in the United States.

Managers of Big Business are prone to blame politicians for the prevalence of a popular psychology hostile to free enterprise and favorable to government action tending to destroy it. As this paper often has emphasized, however, if capitalism ever is destroyed in this country it will be as much an inside job by managers of Big Business as an outside job by politicians. Only too often financiers, in trying to secure control for themselves, afford politicians arguments for government control that are only too convincing to the public. The Van Sweringen case is anything but typical of modern railroad financing; but every demagogue will represent it as typical, and be afforded by it ammunition for attacking private railway management during one of the most critical periods in the history of private railway ownership and management.

If capitalism in the United States is to be saved it will be necessary for financial and business leaders to learn that effective public relations work consists of sound financing and management of Big Business in the public interest and with due regard to public sentiment, as well as in carrying on propaganda to show that free private enterprise is more in the public interest than socialistic policies of government regimentation or management.

Fairer Division of Income Must Not Go so Far as to Destroy Income Source

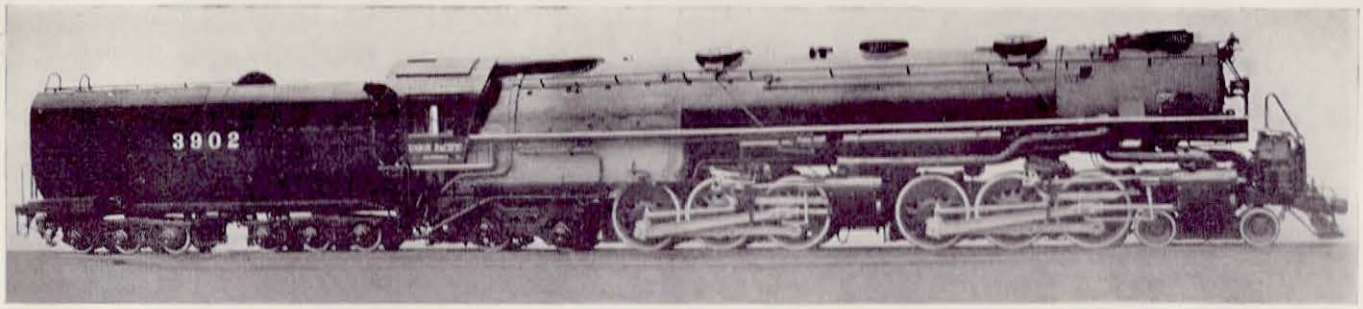
Cities are built by men, countries developed, progress in the arts and sciences, and socially, made because of individual thought, followed by individual and then, if need be, by collective action.

A people may dictate by law a policy that all must be equal in possessions at all times; it follows then, as a corollary in this destruction of true democracy, that all should be called upon for only equal contributions to the wealth of the people. Then without incentive to individual enterprise, for in such a state the political leaders claim both the laurel wreaths and all the power, our country will indeed be but a ragamuffin thing of poverty * * *

The railroads, with the rest of the country, are struggling to find their way out of the depression. With increased earnings they have been increasing employment. We are about two-thirds of the way back to where we were in 1926 with respect to earnings. Stockholders and bondholders have suffered along with the employees, but this we are sure of, that no business is going to survive, much less attract capital, where there is not a black line on the right side of the ledger in the way of profit. More money needs to be taken in than is paid out. If not, in time that business disappears, not only as to capital, but all employment related thereto.

Our objective should be to arrive at that place where we can assure a man, able and willing to work, of a steady job, where he can make a living, save money, be happy in his work, and through insurance or otherwise provide himself and his family against those misfortunes beyond control.

From an address by Paul Shoup, Vice-Chairman, S. P. Co., before Transportation Club of Peoria.



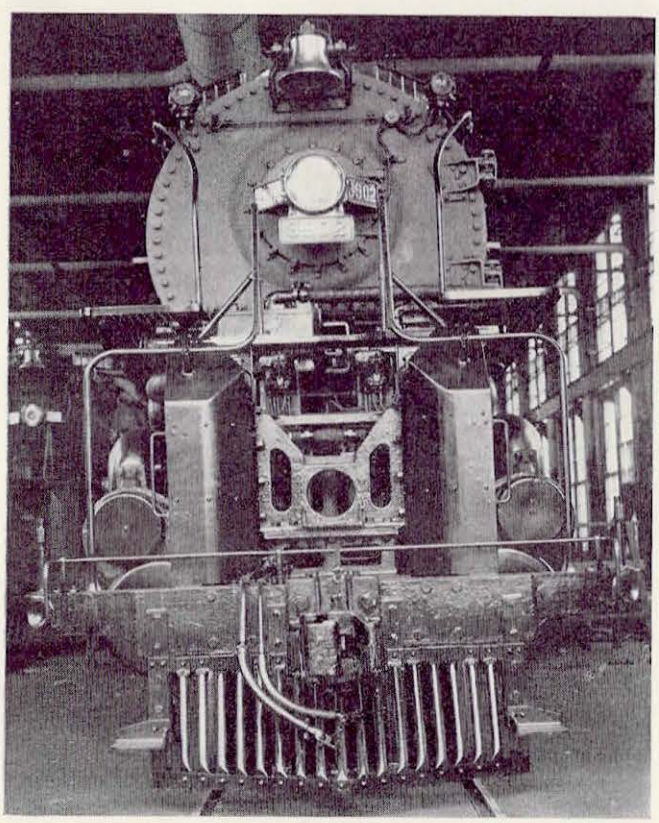
Union Pacific Articulated Freight Locomotive

A Powerful High-Speed Freight Locomotive

4-6-6-4 type built for the Union Pacific by the American Locomotive Company develops 97,400 lb. tractive force and has boiler for high power output

DURING August and September the Union Pacific received 15 single-expansion articulated locomotives of the 4-6-6-4 type from the American Locomotive Company. These were designed for high-speed freight service and are operating in mountain territory. They have a total engine weight of 566,000 lb., of which 386,000 lb. is on the drivers, and develop a starting tractive force of 97,400 lb. The boilers carry a working pressure of 255 lb. per sq. in.; the cylinders are 22 in. by 32 in., and the driving wheels 69 in. in diameter. The boilers have a combined heating surface of 7,031 sq. ft. and the grate has an area of 108.2 sq. ft.

The design of these locomotives includes a number of unusual features and they mark a return to the articulated type of locomotive on this railroad for heavy freight service.* Among the features of particular interest is the use of silico-manganese steel in the barrel courses of the boiler, the backbone construction built into the frame system of the front engine and the universal flexibility of the articulation hinge, with special provisions for stabilizing the riding of this unit under the single bearing by which the boiler is supported on it.



The Air Compressors Are Located on the Front Deck—The Hot-Water Pump of the Feedwater Heater is Mounted on the Smokebox Front

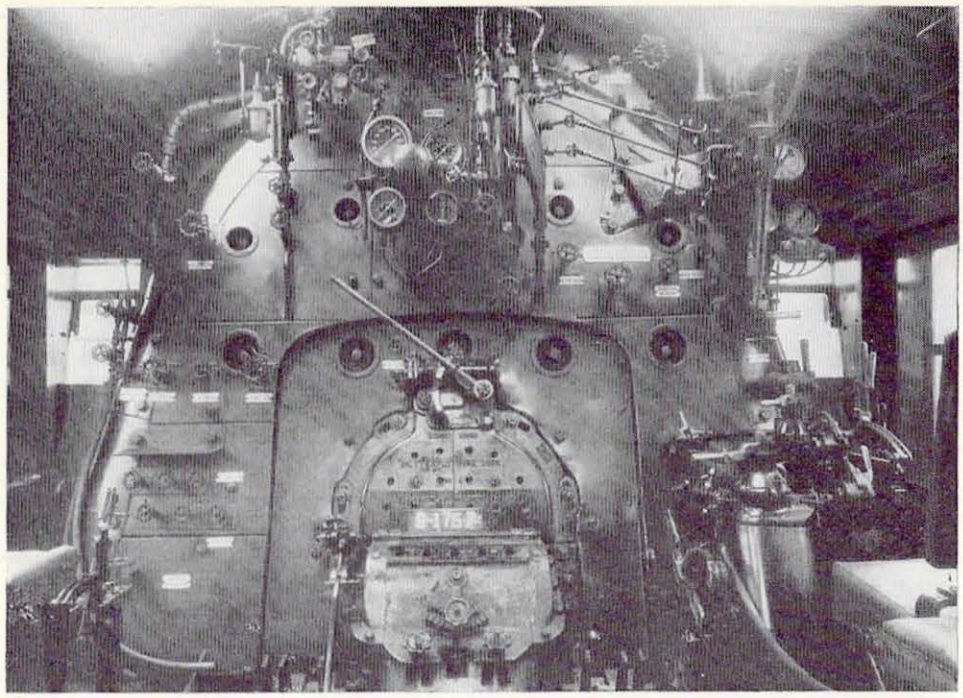
General Dimensions of Union Pacific 4-6-6-4 and 4-12-2 Type Locomotives

	4-6-6-4	4-12-2
Builder	American	American
Rated tractive force, lb.	97,400	96,650
Weight on drivers, lb.	386,000	355,000
Total engine weight, lb.	566,000	495,000
Cylinders, diameter and stroke, in.	4–22 × 32	2–27 × 32 1–27 × 31
Boiler pressure, lb.	255	220
Grate area, sq. ft.	108.2	108.25
Total evaporative heating surface, sq. ft.	5,381	5,853
Superheating surface, sq. ft.	1,650	2,560

The Boiler

The boiler is conical in form, with an inside diameter at the first course of $96\frac{11}{16}$ in. and an outside diameter at the third course of 102 in. The firebox is of larger size than is indicated by the grate area. A Gaines arch is installed with a brick wall across the firebox, 5 ft. 9 in. back of the front throat sheet, thus adding to the volume of the combustion chamber which extends 86 in. from the throat sheet into the barrel of the boiler. There are five 4-in. arch tubes. The firebox is designed

* A comparison of the principal dimensions and proportions of these locomotives and the 4-12-2 type of the Union Pacific are presented in a table.



The Back Boiler Head—The Exhaust Steam Injector Control Is Shown at the Left

with a horizontal mud ring and fuel is burned on Firebar grates, fed by a Standard Type BK stoker.

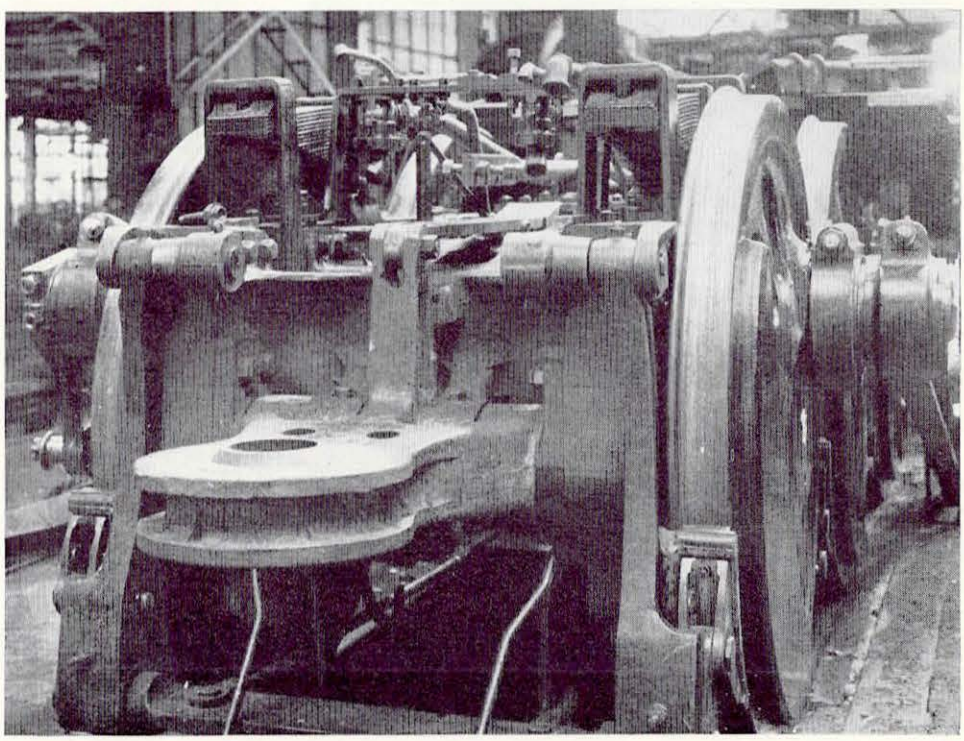
Owing to their size the side and crown sheets are separate and are joined by welding. The inside throat sheet and combustion chamber are also welded into the crown and side sheets. In addition to the Flannery flexible staybolts across the top corners of the side sheets flexible radial stays are applied on the four outside rows on each side of the firebox and combustion chamber, and the adjoining top three rows of staybolts are also flexible. Both the rigid and flexible staybolts, as well as the flexible radial stays, are of Lewis iron. The tapered-end radial stays are of special Ulster iron.

Seal welding is employed on both the inside and outside sheets at the mud-ring corners and at the junctions of the longitudinal and circumferential barrel-course joints, according to the builder's practice. The turret dry pipes extending back from the dome are welded into the turret flange of the roof sheet, and the clamps securing the pipe inside the boiler are welded to the clamp supports, thus providing a permanent installation.

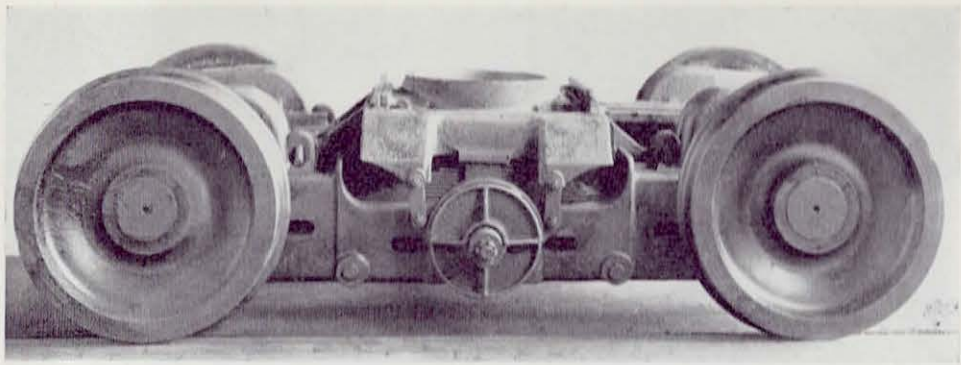
The tube sheets are laid out for the type A superheater. The header is fitted for the American type front-end throttle. Ten of the locomotives are fitted with Worthington No. 6-SA feedwater heaters. The remaining five have Sellers Type S non-lifting exhaust-steam injectors.

The Frames and Cylinders

The frames are of the cast-steel bar type. Those of the rear unit are joined at the rear to the cradle casting and at the front end to the combined cylinder-saddle



The Articulation Hinge at the Rear End of the Front Unit, Showing the Snubber Connection



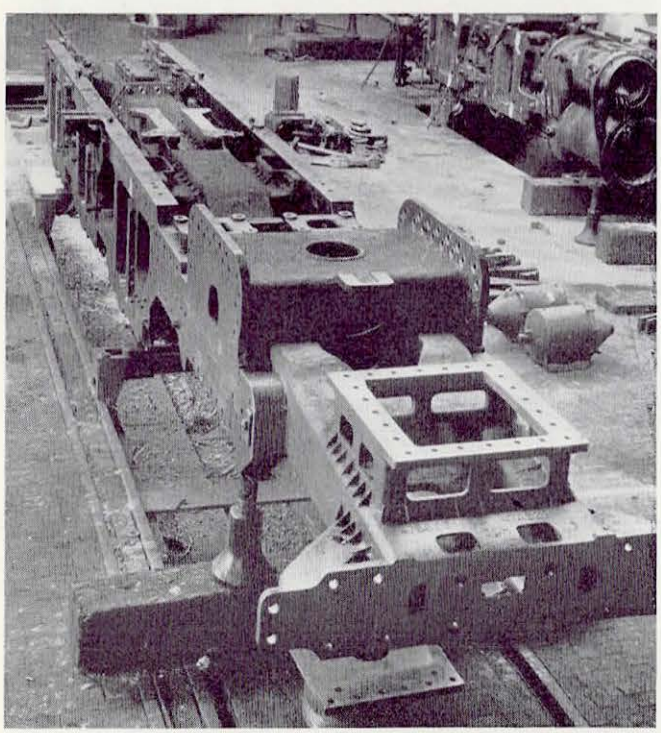
Engine Truck with Friction Type Snubber

and articulation casting. The usual type of cross-bracing is employed.

On the front unit, which has no rigid attachment to the boiler, a unique system of bracing and torsional stiffening has been applied. The front ends of these frames are bolted and keyed to a combined cylinder-saddle and front-deck casting. Bolting pads are provided on the sides of this casting for the cylinders. A box section of this casting extends back from the saddle portion approximately to the front pedestal. The rear end of this casting terminates in a transverse vertical bolting flange, to which is bolted a long box-section casting which extends back between the frames. From this project suitable bolting pads for attachment to the inside faces of the vertical members of the frames. At the articulation casting between the rear ends of the frames transverse bolting flanges again provide for a rigid connection between the two castings. Pads are provided on top of the backbone casting for attachment of the single boiler support.

The articulation hinge is pivoted horizontally in the rear end of the front articulation casting. It is ball connected to the vertical hinge pin in the rear engine unit. This provides for free adjustment of the two engines to vertical track curvature, with the front boiler support as the pivot about which the vertical angular movement of the front frame system takes place.

The pivoted hinge is cast with a vertical bell crank arm to which is attached a stabilizer to prevent possible synchronous oscillations of the front frame system. The stabilizer consists of a wide horizontal bar extending forward along the centre line of the front engine. This bar passes between horizontal white fibre friction surfaces which exert a predetermined resistance to the longitudinal movement of the bar under load of three inner coils from Class G springs and thus prevent the free oscillation of the articulation tongue about its horizontal pivot in the front frame system. Further resistance to the setting-up of a vertical rocking motion in the front frame system is provided by a snubbing device in the engine truck.



The Front Frame System Assembled

General Dimensions and Weights of the Union Pacific 4-6-6-4 Type Locomotives

Railroad	Union Pacific
Builder	American Locomotive Co.
Type of locomotive	4-6-6-4
Road numbers	3900-3914
Date built	August, 1936
Rated tractive force, engine, 85 per cent, lb.	97,400
Weights in working order, lb.:	
On drivers	386,000
On front truck	74,500
On trailing truck	105,500
Total engine	566,000
Tender	310,000
Wheel bases, ft. and in.:	
Driving	12– 2
Engine, total	59–11
Engine and tender, total	97–10½
Driving wheels, diameter outside tires, in.	69
Cylinders, number, diameter and stroke, in.	4–22 × 32
Boiler:	
Steam pressure, lb.	255
Diameter, first ring, inside, in.	96 11/16
Firebox length, in.	213 1/16
Firebox width, in.	108¼
Arch tubes, number and diameter, in.	60– 5½
Tubes, number and diameter, in.	222– 2¼
Length over tube sheets, ft. and in.	22 0
Fuel	Soft coal
Grate area, sq. ft.	108.2
Heating surfaces, sq. ft.:	
Firebox and comb. chamber	548
Arch tubes	77
Firebox, total	625
Tubes and flues	4,756
Evaporative, total	5,381
Superheating	1,650
Combined evap. and superheat.	7,031
Tender:	
Water capacity, gal.	18,350
Fuel capacity, tons	22
Trucks	Six-wheel

The boiler is rigidly attached to the rear cylinder saddle, and the firebox is supported by expansion shoes at each of the four corners. All of the expansion shoes are completely encased so that they are dirt and oil tight. Barco flexible pipe connections are installed between the front and rear engines.

An unusual detail of the frame construction is the fitting of the pedestal caps metal to metal against the frames. The pedestal toes are extra heavy.

The driving wheels are the Alco Boxpok type, and the main drivers, only, are cross-counterbalanced on each unit. The driving axles are fitted with crown bearing

boxes and with Franklin grease cellars. The front pair of drivers in each unit is provided with the Alco lateral cushioning device. The front and rear spring hangers on the front driving-wheel system have coil snubber springs. Similar springs are also applied to the front driving spring hangers of the rear unit and on the rear trailer spring hangers.

The locomotives have Alco engine trucks with lateral resistance of the geared roller type. These are built with a low initial resistance gradually building up to a higher resistance which becomes constant after about 1 in. of lateral movement. The vertical damping device which is built into each side of the engine truck consists of fibre discs mounted on a horizontal spindle at each side of the truck frame. Between the fibre discs are two rotating metal plates, projecting from each of which is a tongue by which it is connected to the end of the bolster, by linkage. The links are on opposite sides of the spindle about which the plates rotate. Any vertical movement of the bolster with respect to the truck frame, therefore, causes the discs to rotate in opposite directions, a movement which is restrained by the adjustable friction load on the discs imposed by a coil spring on the spindle.

The trailer truck is of the Commonwealth four-wheel type. The centering device on this truck is designed to produce an initial resistance of 8 per cent which builds up to a constant resistance of 15 per cent. Both engine and trailer trucks are fitted with SKF roller-bearing journal boxes, those on the front truck being of the inside type and those on the rear truck of the outside type.

The pistons are of solid rolled steel in Z-section fitted with the Locomotive Finished Material Company's combined bull ring and packing rings. The valve chambers are fitted with Hunt-Spiller bushings and the valves have Hunt-Spiller duplex packing rings. Paxton-Mitchell packing is used on both valve stems and piston rods.

The guides and crossheads are of the multiple-ledge type. The piston rods and the side and main rods are carbon steel, normalized and tempered. The same material is also used for the axles and crank pins.

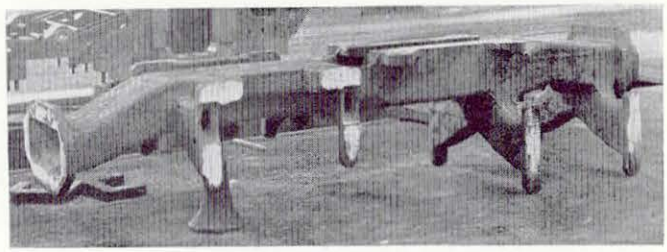
The locomotives are fitted with Walschaert valve motion with the link blocks of each unit at the bottom of the links in forward motion. The reverse gear is a Franklin Type E with 12-in. cylinder. It is directly connected to the reverse shaft of the rear unit and drives the reverse shaft of the forward unit through a reach rod extending forward along the center line of the locomotive with a crosshead and universal joint in the rear cylinder saddle.

Alloy-steel bolts have been extensively used in the construction of these locomotives. Nickel steel is the material for all taper frame bolts, for boiler studs, cylinder-head studs, cylinder-to-frame bolts, and all steampipe bolts. The guide bolts, cylinder-saddle bolts, boiler-bearing bolts, the bolts in the front frame bracing system, pedestal-cap and engine-truck pedestal bolts, among others, are of chrome-nickel steel.

The Steam Pipes

The steam pipes for both front and rear cylinders on each side are connected to a single secondary header outside the smokebox. To this header the front steam pipe is connected with a vertical ball joint. At the steam-chest end it is fitted with a combined ball and slip joint. The relatively long steam pipe to the rear cylinders is fitted with a balanced slip joint at the steam-chest connection. The cast-steel slip pipe is ported and packed on both sides of the ports with Unarco asbestos rings.

Each rear cylinder is provided with an independent exhaust pipe which extends forward along the boiler to one side of a Y-fitting at the nozzle base. The exhaust pipe from the front cylinders has the usual vertical ball connections both at the front (cylinder) and rear (exhaust nozzle) ends, with a ring-packed slip joint. The steam from both front and rear cylinders exhausts into a common exhaust-nozzle chamber from which a single pipe connection leads to the feedwater heater mounted inside the front-end contour just back of the stack, or to the exhaust-steam injector mounted under the cab on the left side.



The Backbone Casting for the Front Engine Frames

The front engines are fitted with Detroit force-feed lubricators with feeds leading to the cylinders, valves and guides and to the steam-pipe joints. Provision has also been made for oiling the flanges of the front wheels should this be found desirable. The rear engine unit is fitted with a Nathan force-feed lubricator with leads to the cylinders, valves and guides and to the steam-pipe joint.

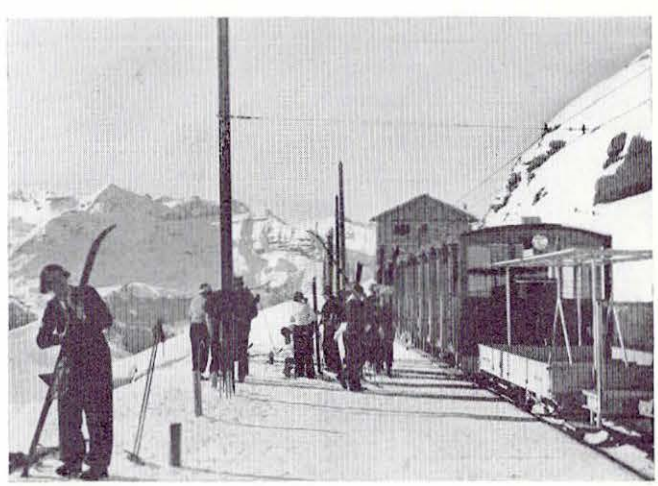
The cabs on these locomotives are insulated with 2-in. paper-covered fibre glass, except for a wood lining on the roof. The fibre glass is also applied under the firing deck.

The interior of the cab presents an unusually neat appearance. All cab piping, as well as the valves, is concealed underneath the boiler jacket. The air brakes are New York No. 8ET with the brake valves pedestal mounted. Windshields at the cab side windows are Prime non-shatterable glass.

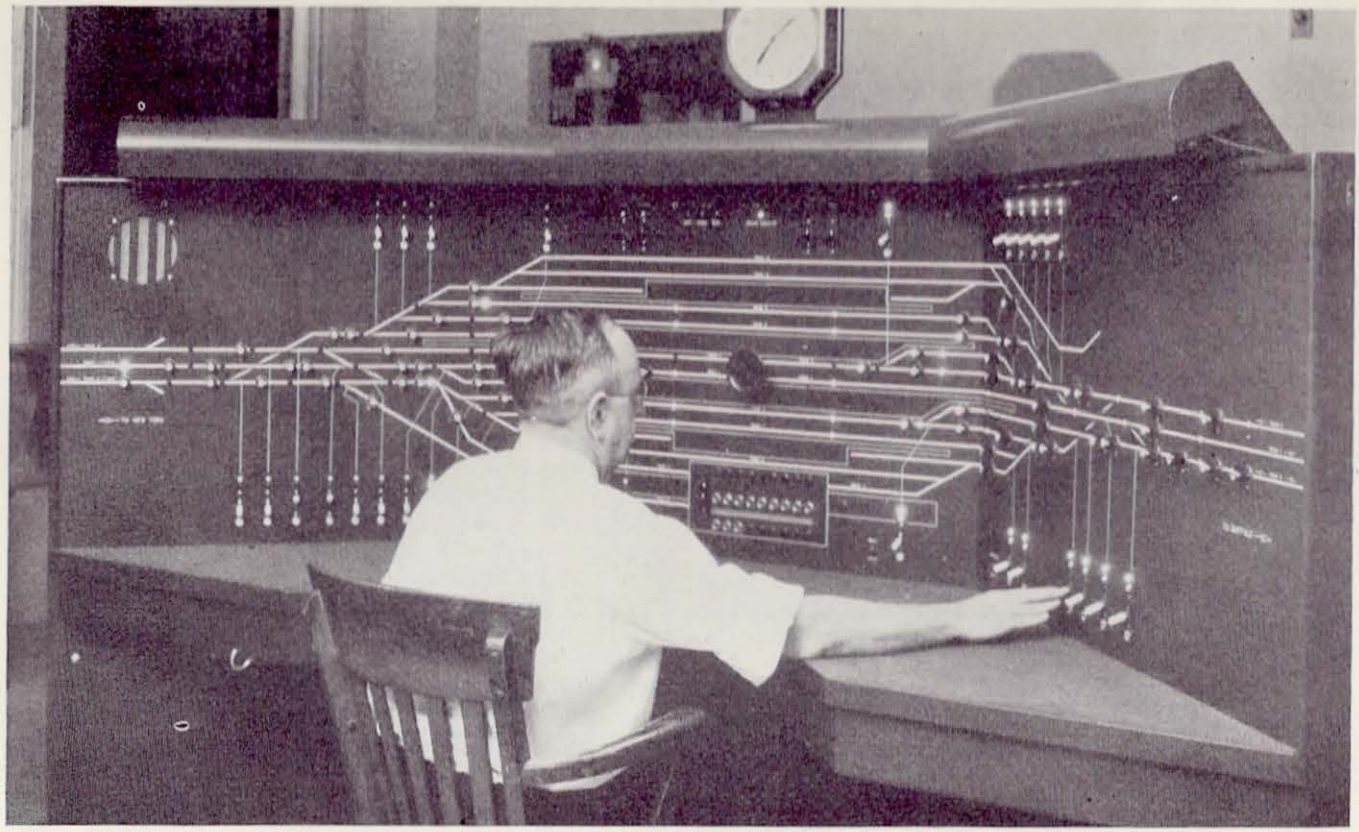
The Tenders

The tenders have cast-steel water-bottom underframes with tanks of semi-Vanderbilt form. They are carried on two Buckeye six-wheel trucks fitted with SKF roller bearings. The engine-tender connections are Unit Safety drawbars with the Franklin Type E radial buffer. Franklin flexible pipe connections are also applied between the engine and tender. At the rear end the tenders are fitted with Miner A-78-XB draft gears.

* * *



A "Snow Train" in Switzerland



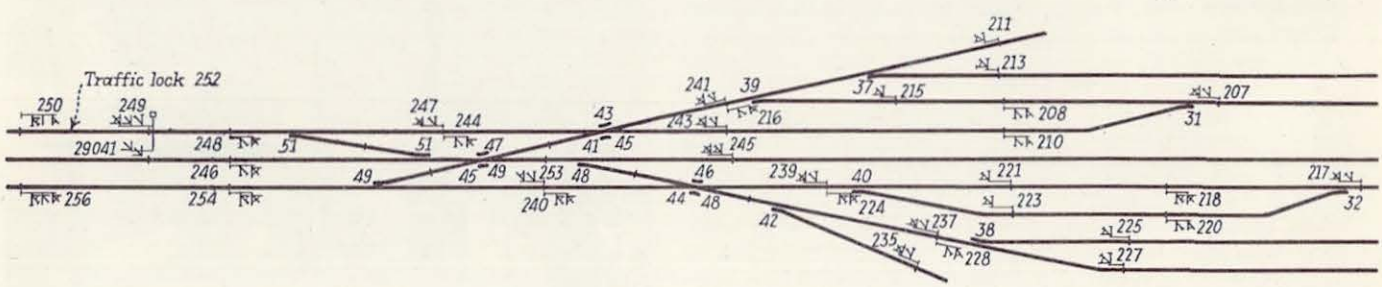
Switches and Signals Throughout the Station Area Are Controlled by a Modern Miniature Type Lever Machine Provided with Complete Indications

Modern Interlocking at Syracuse

New York Central installs centralized control-type interlocking machine with miniature type non-interlocking levers — Dwarfs used as interlocking signals

AS a part of a major improvement involving grade separation throughout the main section of the city of Syracuse, N. Y., the New York Central has constructed a new passenger station including a new track layout, an important part of the project being the installation of an electric interlocking. The new construction extends for about five miles, in which area the new three-track line is elevated over 23 streets, while 1 street crosses overhead.

On this new three-track line, tracks No. 1 and 2 are through passenger tracks. The third track, No. 5, extends from Signal Station 48 westward for about 0.4 mile to a connection with a coach yard. From this yard, track No. 5 extends westward through the station layout, and from the station westward to Signal Station 2, track No. 5 is a running track for St. Lawrence Division trains to and from the passenger station. Ordinarily, through passenger trains will be handled on tracks 1 and 2. The station layout includes 10 through tracks, 5 stub-end sidings for coaches or express cars, 3 double-end sidings for two coaches each and 1 for three coaches. For the present, it is not planned to use the four outside tracks, No. 10, 12, 9 and 11, for regular train movements and, therefore, the switches leading to these tracks



Track and Signal Plan of the Interlocking Throughout the New Passenger Station at Syracuse, N. Y., on

are equipped with hand-thrown stands. Counting branch line as well as through trains, about 100 trains will use the station daily.

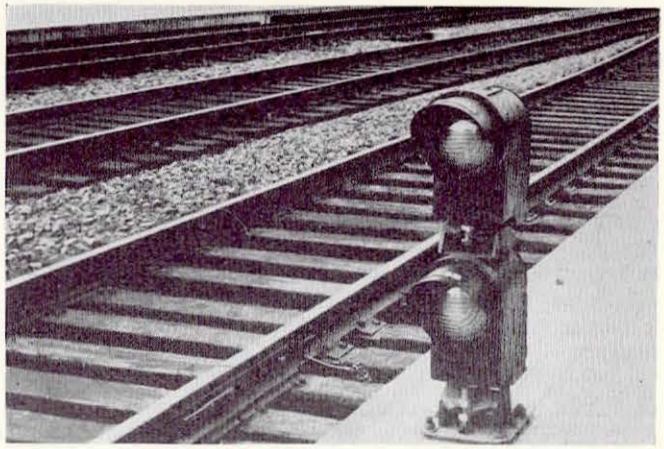
Searchlight-type color-light signals are used throughout and those within the station interlocking are of the dwarf type, arranged to display a complete range of aspects so as to expedite train movements. An interesting feature of the signaling arrangement is that the two main tracks, No. 1 and 2, are signaled for through non-stop train movements at the maximum authorized speed, signals 254, 240, 224, 218, 110, 107, 131, 137, 141 and 245 displaying the aspect of green over green for this movement.

Control Machine

The interlocking limits between home signals 105 and 254 include 60 signals and 41 power-operated switches, slips and frogs, all of which are controlled from a panel type control machine located in Signal Station 1, the operating room forming the top floor or penthouse on the track side of the station building, as shown in one of the illustrations. This room has four windows on each of three sides, facing to the track and in each direction along the tracks, so that the operator has a view of the station track layout. The control machine is arranged in three panels, the end panels being set at an angle of 45 deg. with the center section, so that the operator can reach all the controls without leaving his chair. Each section of the panel is 27 in. high and 36 in. long.

As shown in the diagram, each track in the layout is represented on the panel by a white line. The occupancy of each track section on the plant is repeated on the diagram by a normally-extinguished red lamp mounted in the line representing the track. Each signal control knob is located on the board in a position corresponding to that of the signal on the ground, and its normal position is marked by a white dot. The indication is given by the knob being rotated one-quarter turn to bring this dot to the top when displaying either the clear semi-automatic indication, or the restricted speed indication. A frosted glass in the center of each knob has a black arrow indicating the direction for which the signal is displayed, this arrow being illuminated when the signal is indicating proceed.

Each switch or crossover is operated by a small lever located on the control board either above or below the track diagram, a line extending from the lever to the diagram showing which switch is controlled. The lever operates to two positions, in a vertical direction—down for the switch normal and up for reverse. Two small lamps are located just above each switch lever. The top one, which is yellow, is lighted when a switch is out of correspondence with the lever and is extinguished only when the switch movement is fully completed and is back into correspondence. The lower one of the two lamps is



A Complete Range of Aspects Is Provided by Searchlight Type Dwarf Signals

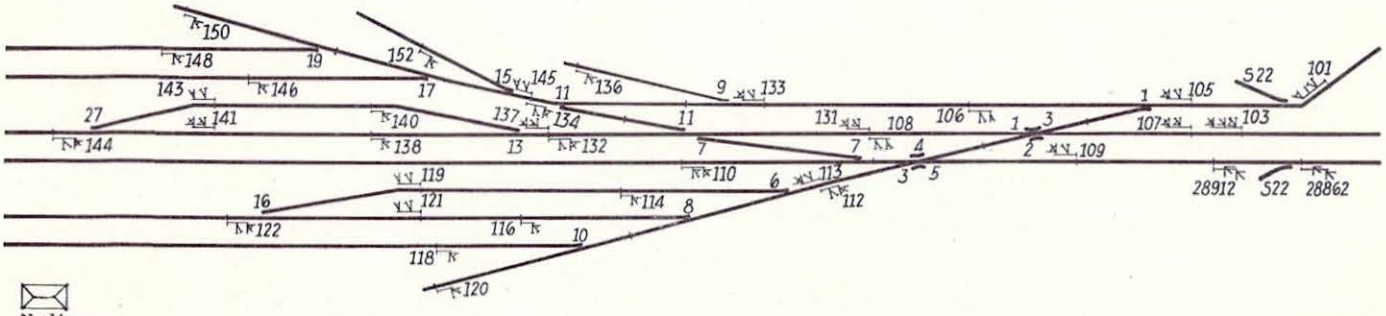
red and is lighted when conditions are such that no action would result from the operation of the lever.

Indications on the Machine

This lamp, known as the "hands-off" light, informs the operator either that he has a signal cleared over that route, thus locking the switch in its present position, or that there is a train occupying the track, which likewise locks the switch. Therefore, nothing would be accomplished by operating the lever. Moreover, the "hands-off" light is lighted and the switch is locked when the signal lever for that route is operated. If the switch lever is moved when the switch is locked (red light is lighted), the correspondence light also lights and both lights remain lighted, even though the condition, which originally lighted the red light, is corrected. In other words, the only way to produce operation of a switch is to move the lever from the position of correspondence when the red light is not lighted.

Movable switch points are provided in the track diagram, these miniature points being moved by magnets which are controlled from the switch-lever repeating relay, the points on the diagram moving to the corresponding position of other switches, the result being that the operator can glance down the track line on the diagram and follow through the entire route which is lined up. This, then, is an efficient means of checking routes, as compared with having to check lever positions.

An important feature of this plant is that there is no mechanical locking, as ordinarily used in interlocking machines. The operator is free to move any control at any time, incorrect operation being prevented by the interconnections of the control circuits. For example, if the operator lines up a switch and clears a signal for the route over the switch, he may again operate the switch



Station

the New York Central Where Dwarf Signals Are Used for Through Movements at Maximum Permissible Speed

lever, but the switch will not operate until he has replaced the signal control knob to normal and again moved the switch lever, thus changing the indication to STOP and enforcing the elapse of a time-locking period before the switch can be moved. One of the advantages of having no mechanical locking is that levers can be operated quickly without waiting for indications and without being confined to a certain sequence in the operation of the controls, all of which facilitates the changing of line-ups, thus preventing train delays.

The operation of this control machine is very simple. To bring a train into the station on either of the two main tracks, No. 1 and 2, requires only the operation of the control knobs to clear the signals for the route. The departure of the train on either of these tracks requires only the operation of one signal. To run a train into or out of any of the other tracks requires the operation of one or more switch levers in addition to the signals.

Accessory Equipment on Machine

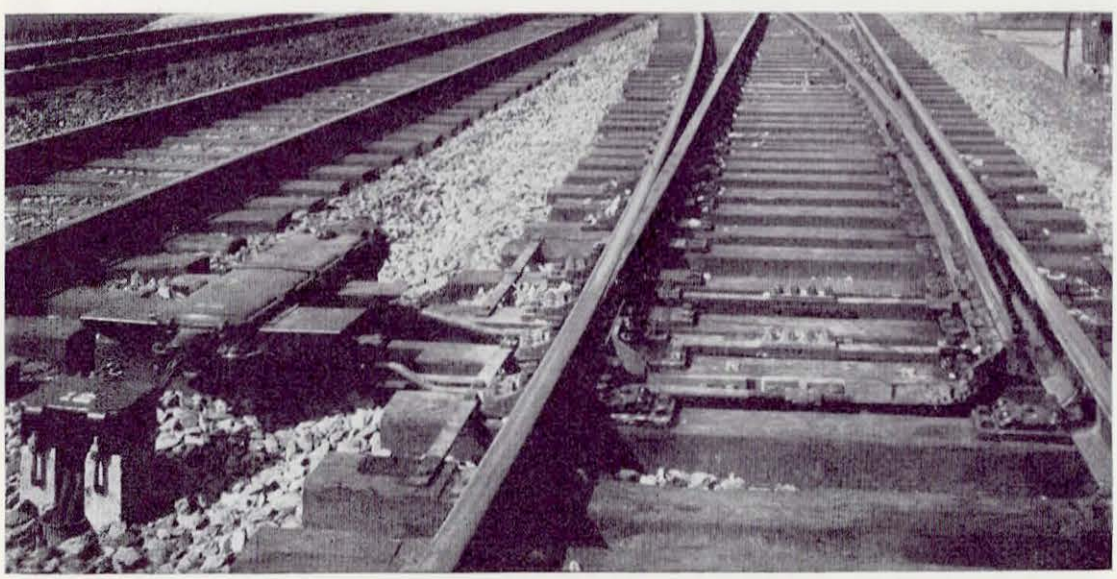
A special effort was made to mount all of the accessory control and communication equipment in the face of the control panels so as not to have various pieces of apparatus attached to the machine in an unsightly manner. The telephone transmitter is mounted behind the center of the control panel, with the mouthpiece in front of the panel directly before the operator. The jack box, for connecting the operator's phone to various circuits, is mounted behind the panel so that the jacks are flush with the face of the board and concentrated in a small area in the center lower section of the panel.

The operator's head-set receiver is cord-connected and, when not in use, hangs on a hook at the left of his chair. A loudspeaker is mounted behind a grill in the upper left section of the control panel. This loudspeaker is normally connected to a circuit extending to the dispatcher's desk, as well as to outdoor type phones located at home signals, passenger station gates, on columns near the end of each track platform and in the relay room, so that the dispatcher, train conductors, gatemen or the maintainer can talk directly to the operator.

Control Circuits

Although the control machine is of the C.T.C. panel type, the circuits of the Syracuse plant do not utilize coding equipment but are based on complete two-wire circuits throughout. The locking for routes and between opposing signals is effected by circuits through relays which repeat track circuits, switches and signals. The switch machines are the Model 5-A, with brake, equipped for operation on 110 volts d-c. An important feature of this Syracuse plant is that the so-called master relay, ordinarily housed in this type of switch machine, has been eliminated. The relay performing this function is housed in the relay room at the signal station, each switch being controlled and operated by a two-wire, 110-volt d-c. circuit from the signal station to the switch. The pole-changers in the switch machine are of the type which automatically center so as to open all circuits if a mechanical connection to the pole changer becomes disconnected.

The indication as to the position of the switch and the point-detector is carried from the switch on a separate two-wire d-c. circuit, controlling a d-c. polar relay, known as the WP switch-position relay. Signal circuit controls over any given switch check not only the contacts of this WP relay, but also those of the relay indicating the position of the lever controlling the switch, assuring the correspondence of the switch and its controlling element. Time locking, to prevent changing the position of switches in a route for a certain period after a signal is taken away, is provided by means of 15-sec. thermal releases for all signals. In addition to this, three-minute clock work releases are provided for high-speed through movements on tracks No. 1 and 2 when signals indicate green over green.



Simplified Arrangement Is Used for the Control of the Power Switch Machines

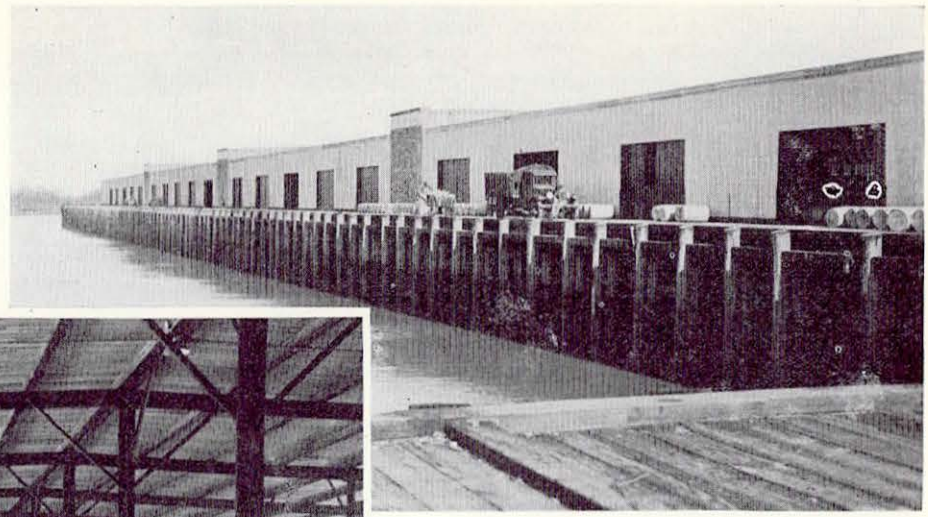
Special System of Power Supply

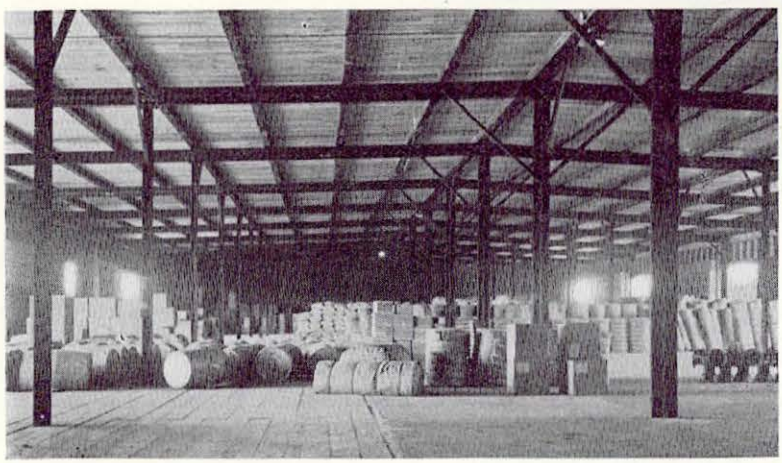
The system of power supply used at this installation represents a further application of new types of equipment, such as mercury pool rectifiers, phanotron tube, dry-plate rectifiers and motor-generators. The special feature of this new installation over and above systems installed previously is that the track circuits and d-c. control circuits are fed from rectifiers, not only normally but also in case of a power outage, no directly connected stand-by batteries being provided.

The 110-volt d-c. bus for feeding the switch machines is normally supplied with power from a mercury pool rectifier, rated at 50 amp., 120 volts output. Only one battery is provided for the entire plant, and this is a set of 100 Edison nickel-iron cells, Type A8H, rated at 300 a.h. The battery is on a floating charge of intermittent direct current taken from the peaks of the cycles of posi-

(*Continued on page 910*)

Right—A View Along the New Wharf and Shed





Left—A General View Through a Section of the Shed Showing the Extensive Use of the Scrap Rail in the Framing

Constructs Pier Shed with Frame of 90-Lb. Scrap Rails

Structure built at Savannah, Ga., by Central of Georgia, 87 ft. by 840 ft. in area, has arc-welded connections

BY utilizing 90-lb. scrap rails with arc-welded connections as the principal members in the frame of a new pier shed which it constructed at Savannah, Ga., the Central of Georgia affected substantial economies in the cost of construction and also, because of the ready availability of the scrap rail, considerably hastened the completion of the structure. The new shed, together with an abutting wharf, were constructed at this company's tide-water terminal on the Savannah river on the site of a structure of wood-frame construction that had been destroyed by fire.

The old building, known as Shed K, was 240 ft. wide and 810 ft. long, and was flanked on the west by a slip 850 ft. long, providing berths for two ship. It was served by two depressed tracks extending along the center of the building for its entire length, and by two tracks along the east side of the structure. The framing consisted of timber trusses supported on wooden posts and carrying a wooden roof. The foundation material consisted of earth fill except along the slip where the wharf apron and a narrow strip of the floor of the shed were carried on pile-supported frame bents. Three transverse brick fire-walls divided the shed into four sections, these walls being the only parts of the structure that remained upright after the fire.

In planning the replacement of the burned shed it was considered sufficient to provide space for transit purposes only, dependence being placed on other buildings in the vicinity for such storage space as would be required. This consideration led to the decision to make the new shed only about one-half as wide as its predecessor and to construct it on the site of the westerly half of the old shed, thereby permitting the depressed tracks to be utilized as platform tracks for the new structure.

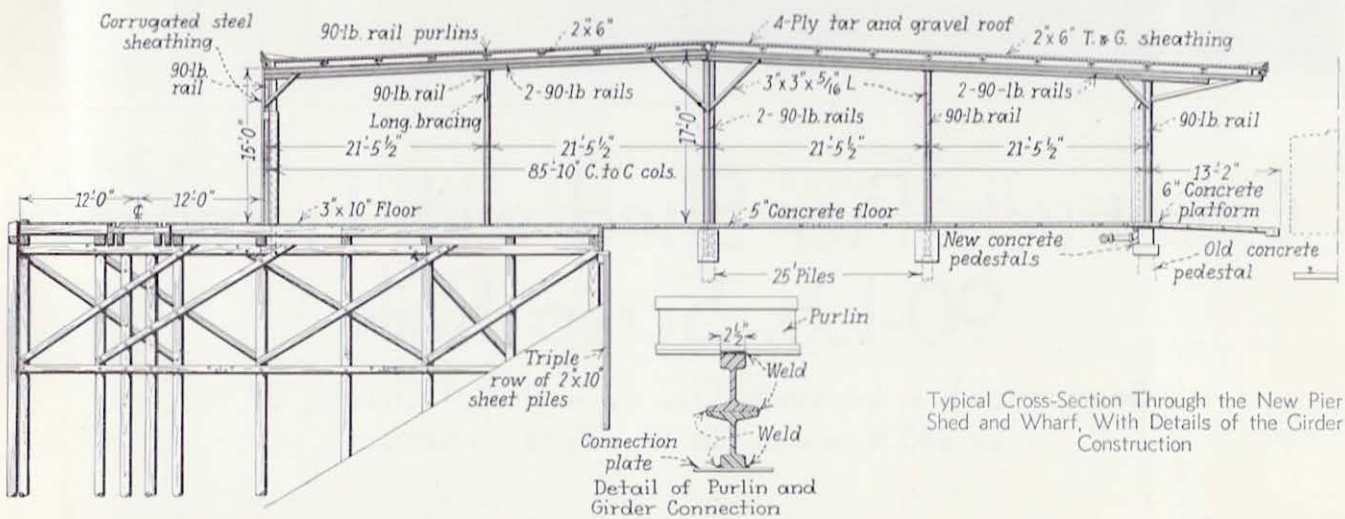
Another controlling factor in the design of the shed was the demand on the part of shippers and stevedores for a "marginal' track along the wharf so that the loading and unloading of open-top cars could be accomplished with ships' tackle. It was also desirable that sufficient platform space be provided on each side of the marginal track to permit the handling of lading to and from box cars. It was decided, therefore, to provide a marginal track in the center of an apron measuring 24 ft. from the edge of the wharf to the face of the shed. After giving effect to these considerations, it was decided to make the new shed 86 ft. 9 in. wide, exclusive of the wharf apron and the 13-ft. trucking platform on the east side, and 840 ft. long, or slightly longer than the old shed.

The new shed is a flat-roofed structure with a pitch of 1 in 20 each way from the longitudinal center line

and is designed for a live load on the roof of 30 lb. per sq. ft. The frame, consisting entirely of 90-lb. scrap rails, embraces transverse rows of columns supporting roof girders on which longitudinal purlins are carried. On the east side the roof is cantilevered 12 ft. beyond the wall of the shed to provide a covering for the trucking platform. To permit the use of existing pedestals as footings for the columns in the east wall, a spacing of 18 ft. between rows of columns was adopted. This arrangement also permitted the existing fire-walls, after repointing and the necessary alterations in size were made to be incorporated in the new structure.

The roof covering consists of a four-ply built-up tar and gravel surface applied over 2-in. tongue-and-groove sheathing. The walls are of 22-gage corrugated galvanized copper-bearing steel fastened to wood framing, wainscoted on the interior with 1-in. rough boards. The doors, which slide horizontally, were built on the ground and comprise in each case two thicknesses of 1-in. boards covered on both sides with second-hand metal car-roofing.

For a width of 54-ft. from the east wall, the shed is provided with a 5-in. reinforced concrete floor. West of the concrete floor, which terminates at a sheet-pile bulkhead, the foundation of the shed and the wharf consists



Typical Cross-Section Through the New Pier Shed and Wharf, With Details of the Girder Construction

of untreated long-leaf yellow pine piles arranged in bents, containing 9 piles each, which are generally 7.74 ft. center to center. This part of the structure is provided with a creosoted yellow pine deck. At the fire-walls, 20-ft. sections of the side walls are of brick construction and opposite each fire-wall a concrete apron 20 ft. wide extends out to the edge of the wharf.

Why Rail Was Chosen for Frame

The decision to construct the frame of the new pier shed of 90-lb. scrap rails was reached only after careful studies had been made of the relative advantages of this type of construction, all-wood construction and a new structural steel frame. In these studies the primary considerations were economy and the need of constructing the new shed and placing it in service with a minimum of delay. As scrap rail could be obtained with no cash outlay and with only a charge of $10.75 a ton (its sale value as scrap), it offered the greatest economy. This type of construction, it was estimated, would cost about $11,000 less than an equivalent structure of all-wood construction, this estimate being based on experience with scrap rail building construction which this road obtained during the construction of a similar, though smaller shed at Rome, Ga., about two years ago. Moreover, while it was estimated that from 60 to 90 days would have been required to cut and season lumber for all-wood construction, the necessary scrap rail was on hand at Columbus, Ga., and could be made available without delay.

The economy of scrap rail construction is due in some measure to the fact that, within certain limits, this type of frame, with arc-welded connections, can be fabricated at the site of the structure, thus eliminating the cost and time involved in shop fabrication. Another consideration that influenced the choice of scrap rail was the fact that the road had already employed this type of construction successfully and the knowledge gained in the previous experience could be employed to advantage in the design and construction of the new shed.

Details of Frame

Each transverse row of columns in the shed consists of a center post and two columns on each side, which are located on 21-ft. 5½-in. centers. Each of these columns consists of a single rail, except the center post which is comprised of two rails placed base to base and fastened together with 3-in. stitch welds at intervals of 3 ft. on each side of the bases.

West of the bulkhead line, the bottom of each column is fillet welded to a ½-in. square base plate which is rigidly fastened by means of four bolts to the deck structure. East of the bulkhead each column bears on the top of a 25-ft. pile, the load being distributed by means of a ½-in. base plate fastened to the top of the pile by four lag screws. The columns extend somewhat below the concrete floor, and the lower end of each column and 6 in. of the top of the supporting pile are encased in a concrete pedestal 2 ft. square and 3 ft. 3 in. high. The concrete in the pedestals was placed after the columns had been erected. The east wall columns are supported on reconstructed concrete pedestals that rest, in turn, on the tops of existing piles, the bottoms of the columns being welded to base plates which are fastened by means of anchor bolts to the tops of the pedestals. In height above the floor level, the columns vary from 19 ft. at the center post to 14 ft. 2½ in. at the side walls.

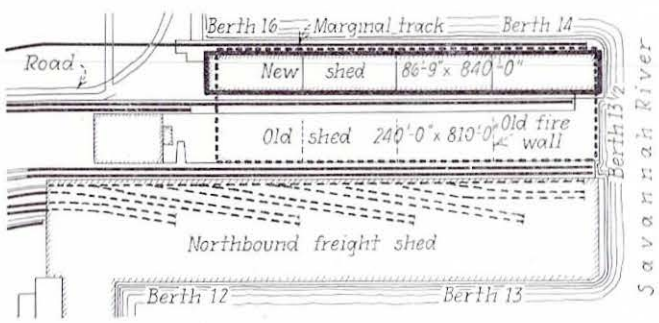
Like the center posts, the roof girders consist of two rails with the bases stitch-welded together on both sides at intervals of 3 ft. Except where they are cantilevered beyond the east wall to provide a support for the roof over the trucking platform, the girders form simple spans between the columns. For connecting the ends of the girders to the columns, 5/16-in. rectangular bearing plates welded to the head of the inverted rail

at each end of the girder are bolted to cap plates of corresponding size and thickness that are welded to the top of each column, these being the only permanent bolted connections to be found in the scrap rail frame. The connections of the girders to the wall columns and the center posts involve the use of four ¾-in. bolts, while at the intermediate columns only two bolts are used. The tops of the columns are beveled to conform to the pitch of the roof.

The purlins consist of single rails placed in the normal position, these members being formed in continuous lines, 5 ft. 4 in. apart, by butt-welding the ends. The fastening of the purlins directly to the roof girders is accomplished by the application of fillet welds along each side of the bases of the purlins wherever they bear on the girders. To permit the sheathing to be nailed to the roof structure, 2-in. by 6-in. nailing strips are applied to each side of each purlin, being held in position by bolts, on 2½-ft. centers, which extend through the web of the purlin. Knee bracing, consisting of 3-in. by 3-in. by 5/16-in. structural angles with welded connections, is provided at the tops of all columns.

Fabricated on the Ground

All work in connection with the fabrication of the rail framing was done on the site of the building, the rail being received in 33-ft. lengths and arranged on skids by a locomotive crane as it was unloaded. All

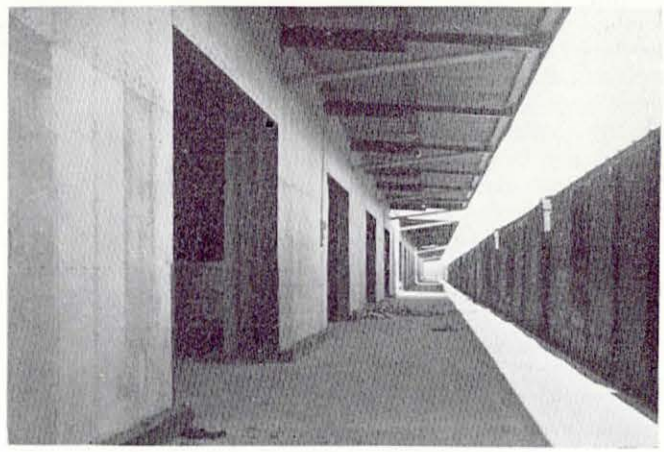


Plans of the Facilities at Savannah Showing Outline of the Old and New Sheds

cutting of the rails, including the beveling of the tops of the columns and the cutting of the bolt holes, was done with an acetylene torch, this work being supervised by a representative of the Oxweld Railroad Service Company. In beveling the tops of the columns, a jig was provided for guiding the torch at the proper angle and, as the operator quickly gained skill in the use of this device, the cut surfaces required only a small amount of finish grinding. All oxy-acetylene cutting work was done by a welder with one helper.

As much as possible of the arc-welding work was accomplished while the rails remained on the skids. This work included the welding together of the rails comprising the center posts and the roof girders, and the application of all fastening plates, these plates being furnished in the proper sizes and with the bolt holes punched. Before any welding was done, however, it was necessary to remove the rust and scale from the rails at the location of the welds, a portable electric grinder with a rigid shaft being used for this purpose. All the welding work, which was done under contract, was accomplished by three welders and three helpers.

The welding contractor used a 300-amp. d-c. electric driven welding unit for all welding that was done prior to the erection of the frame and a 250-amp. gasoline-driven generator mounted on a truck for the welding



A View of the Platform on the Land Side of the Shed

that was done during the erection of the members. The latter work included the butt-welding of the purlins, the welding of these members to the girders and the welding of the knee bracing. It was found that the best results in welding were obtained by having all surfaces well cleaned and by running the welds slowly to obtain good penetrations. Special care was employed in making welds involving the rail heads because of the greater hardness of this metal as compared with that in the webs and bases.

The design of the welded connections in the frame was based on a unit stress in the welds of 11,300 lb. per sq. in. in shear and of 13,000 lb. per sq. in. in direct tension. As the result of experiments with various types of welding rods a mild carbon-steel uncoated rod was chosen for use on this project. The cost of the welding varied between four and six cents per lineal inch of weld depending on the type and location of the work.

Erection Procedure

The handling of the frame members during erection was carried out so far as possible with a locomotive crane operating from the marginal track and from one of the platform tracks on the east side. Where the final positions of the columns and girders could not be reached by the crane these members were erected with small hand winches on A-frames. The purlins, to which the nailing strips had previously been applied, were lifted to the tops of the girders by the crane and slid along on those members to their final positions.

Full-length rails were used for the purlins and no

A Close Up View of One of the Column and Roof Beam Connections

attempt was made to determine the location of the joints. For holding adjoining purlins in alinement for welding, strap steel plates were bolted across the ends, these straps being removed after the heads and bases of the abutting rail ends had been welded together. When the butt-welding of the purlins had been completed, gaps that had been left in the nailing strips at the joints were filled with lengths of 2-in. by 6-in. pieces. The knee bracing was applied after the erection and welding of the purlins had been completed.

The old pier shed at this location was destroyed by fire on March 15, 1935. Construction of the new shed was commenced on May 1, 1935, and was completed on November 15 of that year at a total cost of $115,000. The erection of the frame was started on July 1 and was completed in 60 days.

The new shed is rigid and stiff, and, since there are no extremes of temperature to contend with, no difficulties are expected with expansion and contraction. The structure is free from vibration and even when the wharf is struck by ships when docking, no perceptible movement of the frame has been noticed. No broken welds have developed.

The design and construction of this pier shed, which involved the use of 430 tons of rail and approximately 6,000 lin. in. of welds, were carried out under the general supervision of H. F. Sharpley, assistant chief engineer of the Central of Georgia, assisted by J. B. Maddock, engineer of bridges and buildings, and G. A. Belden, architect. The welding contractor on the job was G. C. Hunt & Co., welding engineers, Atlanta, Ga. All other work in connection with this project was done by company forces.

Modern Interlocking at Syracuse

(*Continued from page 906*)

tive current from the rectifier output. This result is effected by a FG-104 phanotron tube which acts as a valve, allowing current to flow into the battery when the instantaneous value of the rectifier output exceeds the battery voltage. The low-voltage d-c. control circuits are normally fed from a group of five dry-plate rectifiers. Each track circuit is fed by a half-wave rectifier.

In case the main incoming sources of a-c. to the signal station all fail, the a-c. load of the track circuits and control circuits is switched automatically to the output of an inverted converter, rated at 700 volt-amp. This small machine is normally operated on a no-load output at about 3,700 r.p.m., being fed direct current from the mercury tube rectifier. In case the a-c. power goes off, a resonant relay releases to switch the feed for the track and control circuit rectifiers so as to be fed from the a-c. output of this small converter, the d-c. motor end of the machine being fed from the 110-volt storage battery. The action of the resonant relay and attendant circuit controller is so fast that this change-over is accomplished within three cycles, or in other words, $\frac{1}{20}$ of a second. Therefore, the d-c. track relays or the d-c. control relays fed from rectifiers do not drop during this change-over. This resonant relay also acts as a low-voltage, cut-over control. If the 110-volt feed drops to approximately 90 volts, the relay drops and functions as explained previously.

As an emergency supply for the a-c. signal lamp distribution circuits, a motor-generator was provided. The a-c. alternator end of this machine, rated at 2.5 kv.a. at 115 volts, is directly connected to a 5-hp. d-c. motor. When the main a-c. source of power is cut off, quick-acting relays connect the 110 volts d-c. from the main battery to start and run this motor-generator to supply 115 volts a-c. for the signal lamps. This motor-generator will start and attain speed so as to take on the load in a period of about two seconds so that there is no perceptible discontinuance of the signal aspects. In order to prevent excess brilliancy of the signal lamps at night, an arrangement is provided for dimming these lamps, the control being effected by small levers on the interlocking machine.

This interlocking was planned and installed by the signal department forces of the New York Central, Lines East, the major items of interlocking equipment being supplied on contract by the General Railway Signal Company, and the special power supply apparatus was furnished by the General Electric Company.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading for the week ended December 5 totaled 744,957 cars, an increase of 64,973 cars or 9.6 per cent above the figure for preceding week, an increase of 106,439 cars or 16.7 per cent as compared with the corresponding week in 1935, and 604 cars or one-tenth of 1 per cent above the corresponding week in 1930. All commodity classifications except ore showed increases over the preceding week and all showed increases over last year. The summary, as compiled by the Car Service Division, Association of American Railroads, follows:

Revenue Freight Car Loading

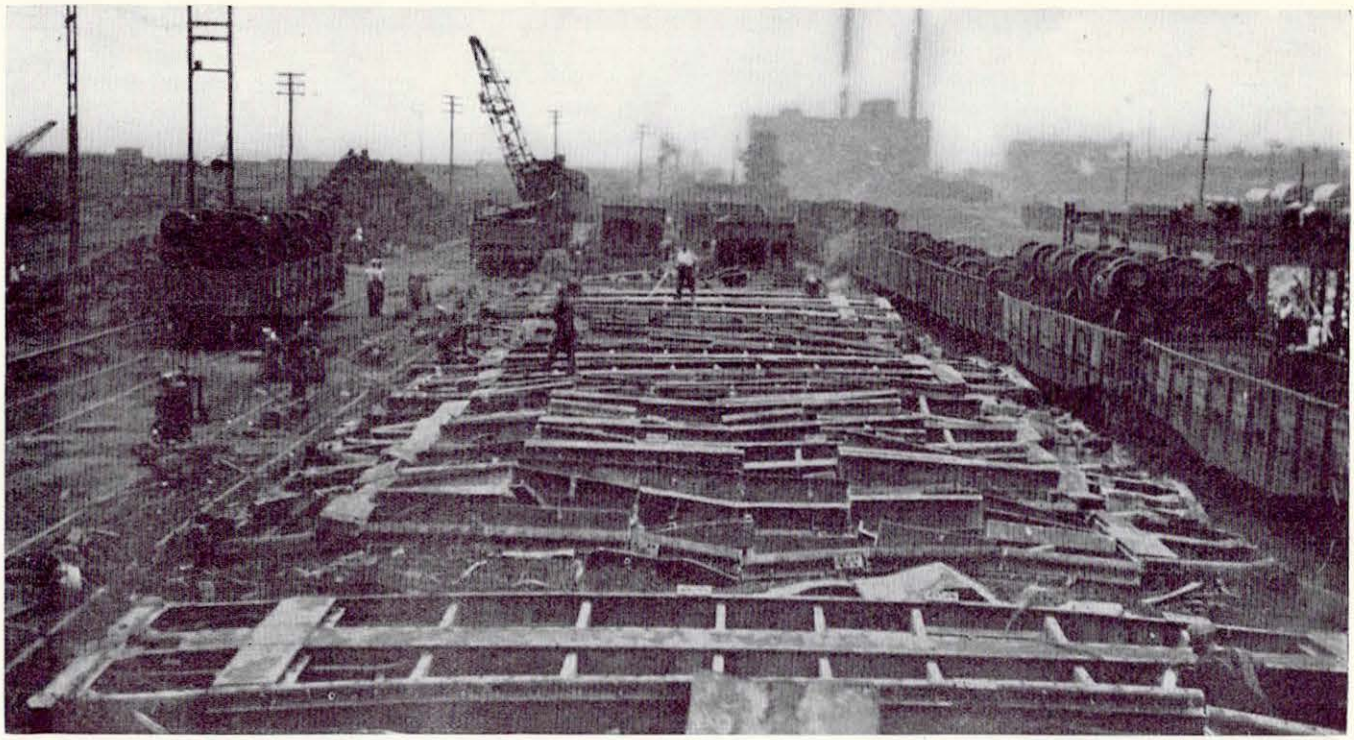
For Week Ended Saturday, December 5, 1936

Districts	1936	1935	1934
Eastern	166,702	146,740	119,812
Allegheny	150,409	122,397	101,444
Pocahontas	55,687	42,741	35,726
Southern	109,744	94,277	86,404
Northwestern	86,290	76,036	67,914
Central Western	115,066	100,477	89,554
Southwestern	61,059	55,850	50,631
Total Western Districts	262,415	232,363	208,099
Total All Roads	744,957	638,518	551,485
Commodities			
Grain and Grain Products	36,267	30,996	28,530
Live Stock	17,851	15,154	20,201
Coal	168,087	137,991	119,074
Coke	11,646	8,611	5,247
Forest Products	33,734	29,565	20,569
Ore	8,165	7,304	3,597
Merchandise L.C.L.	168,606	158,608	156,515
Miscellaneous	300,601	250,289	197,752
December 5	744,957	638,518	551,485
November 28	679,984	571,878	488,185
November 21	789,500	647,924	561,942
November 14	784,672	629,728	585,034
November 7	759,318	654,947	594,790
Cumulative Total, 49 Weeks	34,032,646	29,820,130	29,291,876

Car Loading in Canada

Car loadings in Canada for the week ended December 5 totaled 50,047, as compared with 44,921 in the forty-ninth week last year and 49,586 cars for the forty-eighth week this year, according to the weekly statement of the Dominion Bureau of Statistics.

	Total Cars Loaded	Total Cars Received from Connections
Total for Canada:		
December 5, 1936	50,047	27,612
November 28, 1936	49,586	25,751
November 21, 1936	51,521	28,094
December 7, 1935	44,921	22,152
Cumulative Totals for Canada:		
December 5, 1936	2,344,259	1,154,008
December 7, 1935	2,236,566	1,046,273
December 8, 1934	2,206,235	1,041,406



The Last of 20 Freight Cars—Bodies Destroyed, Trucks Loaded, Underframes Ready for Loading by Gantry Crane

Pennsylvania Railroad Destroying 32,000 Freight Cars

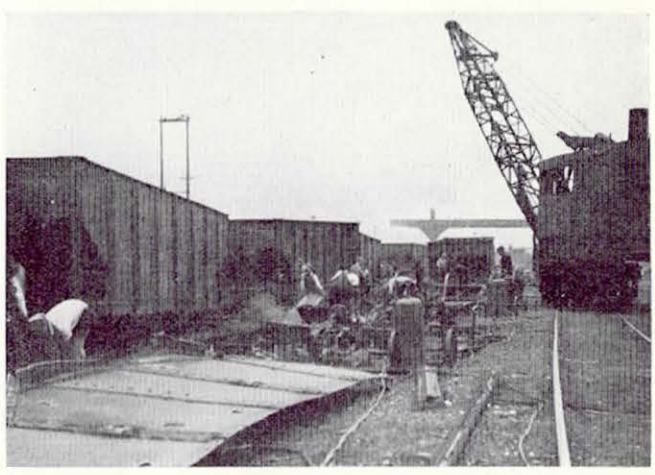
Largest equipment-junking program on record increases operation of world's largest railway scrap yard

Part I

THE Pennsylvania is now engaged in a freight car retirement program which is believed to be the largest project of its kind attempted at one time. The program includes about 32,000 box, hopper and gondola cars, equal to about 13 per cent of the freight car equipment owned by the road, and, at its peak, was carried out at the rate of approximately 90 cars a day—22 at Terre Haute, Ind., 20 at Harrisburg, Pa., and 50 a day at the company's scrap and reclamation plant at Conway, Pa., near Pittsburgh.

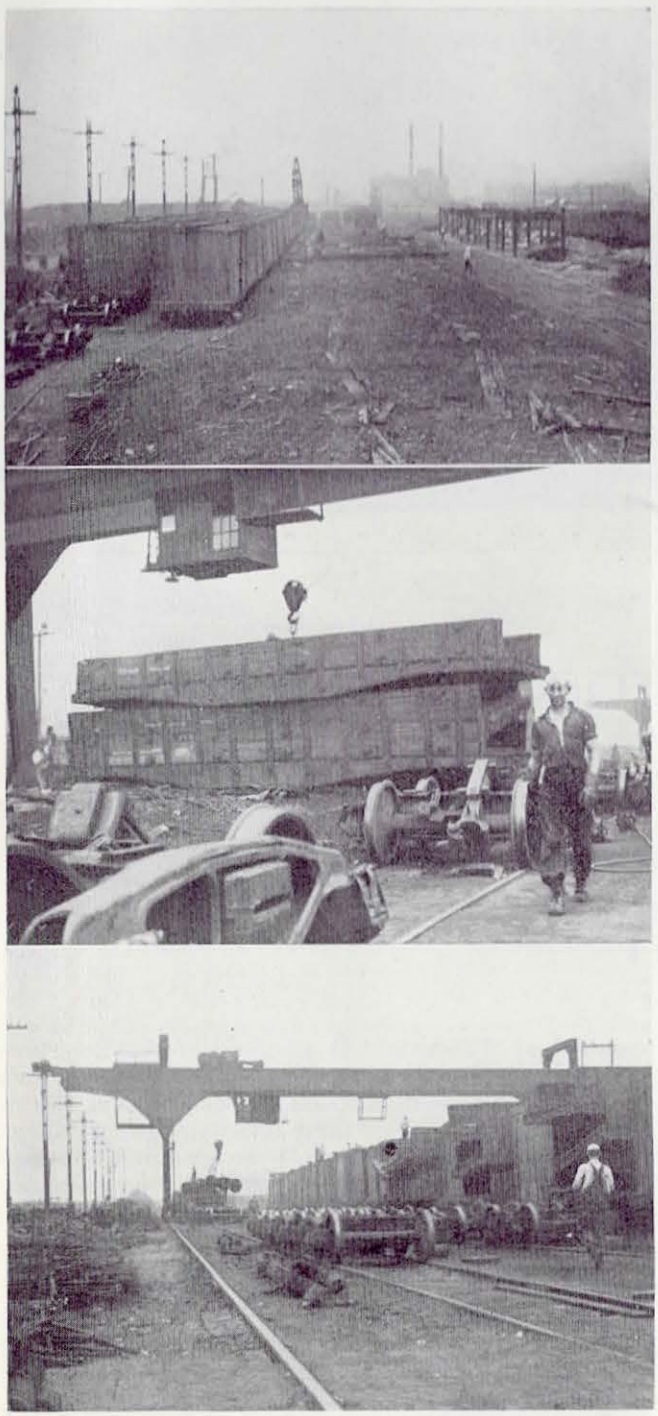
The equipment being dismantled is in addition to the normal scrapping of company service and revenue cars damaged beyond repair in service, and consists of all-steel and steel-underframe cars which have outlived their usefulness for present day service or cannot be repaired or modernized without unwarranted expenditures. The program includes many steel cars with sides rusted through, also hundreds of cars with arch bar trucks, which will be barred from interchange after 1937, in accordance with rulings of the Association of American Railroads.

Improvements made in recent years in the handling of cars, by reason of changed terminal and operating conditions, will permit the movement of the 1929 volume of business with a lesser number of cars than were required at that time. It was, therefore, considered economical to retire approximately 32,000 freight cars of more or less obsolete design rather than incur a large expenditure for placing them in serviceable condition. These types of cars, moreover, were not suitable to meet



One Hour After Attacking Steel Cars with Gas Torches

present day traffic requirements. It was also found advantageous to undertake the destruction of these cars at this time because of the opportunity to co-ordinate the work with new equipment programs, an order having been placed for 10,000 new freight cars. The increase in scrap prices and the recovery of considerable salvage for use in car repair work also contribute to the beneficial results from the undertaking under present conditions.



Putting Condemned Cars on Spot—Removing Bodies From Trucks—Bodies in Place for Destruction

Under the retirement plan, all cars subject to retirement are inspected when taken out of service for repairs, and if found unfit for repair are moved to the proper dismantling point where they are reduced to scrap by company forces working three shifts. About half the work is assigned to Conway because it is close to one of the largest freight classification yards of the railroad and has unusually extensive facilities for all stages of the work, including the reconditioning of materials suited for further use.

This plant is the largest railway scrap handling point in the country and employs about 450 men for all purposes. It occupies 90 acres of land, measures a half-mile in length from end to end of crane runway and has three gantry cranes as well as several locomotive cranes. The forward end of the truck yard, including about 1,000 ft. of land under the crane, is being used for all car dismantling, with the exception of the truck dismantling which is performed at the opposite end.

Condemned cars are brought to Conway in solid trains of 100 cars and are switched into the yard early each morning in 50-car lots, containing 20 box, 10 gondola and 20 all-steel hopper cars. The box cars and gondolas are placed on two parallel tracks within the craneway where the bodies can be removed by a gantry crane. One of these tracks is the outbound track for the scrap yard and the other is a stub-end track. The steel cars are placed partly on this stub-end track and partly on an adjacent spur where they are handled by locomotive crane.

Destroy 20 Hoppers a Day

The first step in dismantling the cars is to remove the bodies from the trucks. Steel cars are simply disconnected from the trucks and placed on the ground without preliminary stripping of reclaimable parts. They are then dismembered in accordance with printed schedules explaining with the aid of diagrams the manner in which the metal should be cut. All good angles, side and floor sheets are recovered for use in repairing other cars. The reclaimable materials also include good drop doors, rods and pipe and fittings, as well as the brake rigging, draft gears, couplers, grab irons and similar attachments. The rest of the car is reduced to scrap steel of charging box size or other marketable grades. This work is performed by 18 cutters divided into 4-men gangs, each equipped with an air hammer and oxy-acetylene torches. The trucks are loaded immediately into empty cars for shipment to the truck dismantling yard as called for. A gang of four laborers, working on the second shift with a locomotive crane, clears the car yard of the steel car scrap and reclaimable materials and prepares it for a repetition of operations on the following day.

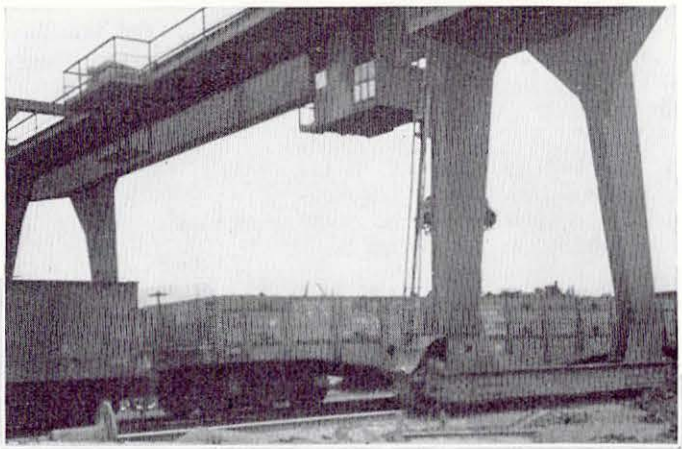
Fast Work on Box Cars

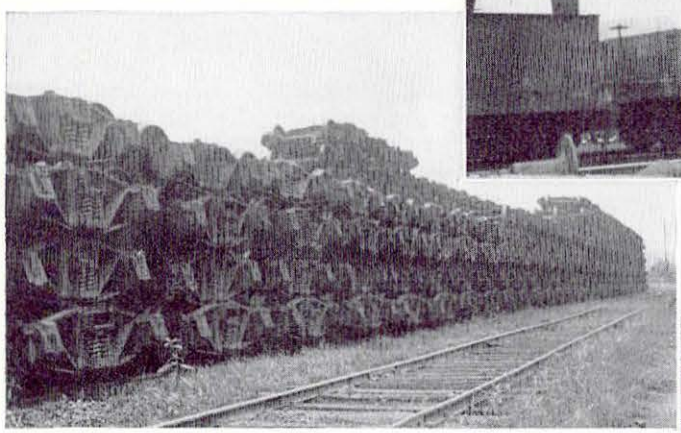
Where cars with wood bodies are dismantled on the Pennsylvania, the bodies are sold or placed where the wood can be removed for fuel, if this is practicable; otherwise they are burned. The bodies to be burned, while still on their trucks, are first stripped of all attachments, this work being performed by a floating gang of four men who then return to other work in the reclamation shop adjacent to the scrap yard. These men also cut holes in the roof and floor of each car through which to pass a cable, this being a safer way to move the bodies than to throw slings around the cars. The bodies are then lifted by a gantry crane and placed crosswise in the burning space between the craneways. Gondola bodies are piled in tiers of three between box car bodies to insure complete burning as well as to conserve space. The box car bodies are then stripped of metal roofing and all trucks are loaded in cars marked for the truck-dismantling yard. Burning is performed by the night gang, who also wet down the ashes and separate all rods and angle irons from the underframes.

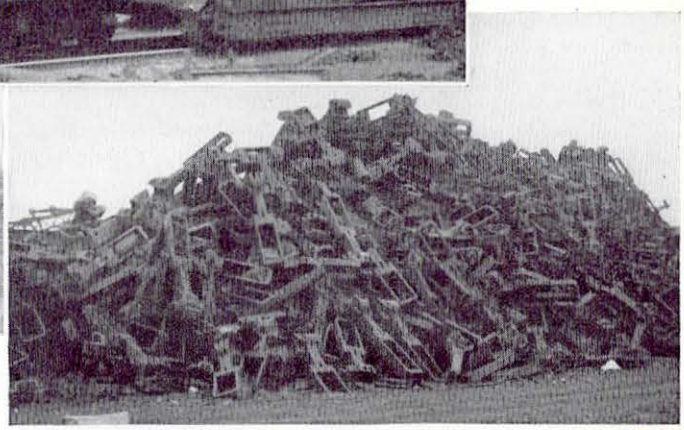
The location is alternated from one place to another

Top—Under A Traveling Gantry at Conway

Bottom—Trucks and Couplers from Dismantled Cars





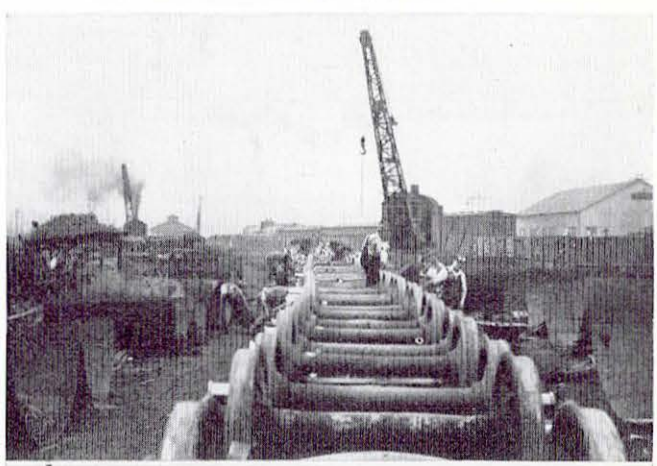


so that cars burned one day are cut up the next. This work is performed by 16 cutters working in two-man teams, and the underframes are reduced chiefly to metal of charging box size, with the exception of sections detached for further use, as outlined in standard instructions explaining in detail where the cuts should be made on each type of car. Instructions governing the reduction of the sides and underframes of gondola cars, for example, are as follows:

Cut 28 stakes at side sills.
Cut 56 bolts in 2 top angles.
Cut 2 side angles into 60-in. lengths.
Cut end sills from side sills.
Cut end sills to length in center.
Cut cover plate and center sills from end sills.
Cut diagonal braces from sills and bolster.
Cut or split cover plate entire length of car.
Cut or split top and bottom bolster tie plates, including 16 rivet heads, and remove side bearings and center plates.
Cut 12 intermediate and wheel diaphragms from center and side sills.
Cut cover plate and center sills at crossbearer.
Cut crossbearers from center and side sills.
Cut center sills from bolster.
Cut off reservoir cylinder brackets from diaphragm and cylinder.
Cut or split side and center sills to mill sizes.
Cut bolsters from side and center sills.
Cut 8 nailing sill supports from end sill and bolster.
Cut 8 nailing sill supports from bolster.

Air Hammers Cut Gas

Hose connections for oxy-acetylene are provided at intervals of 35 ft.; and to further expedite the work and insure complete cutting, the underframes are marked where they should be cut. A large reduction in the consumption of gas is provided for by going over portions of the underframes with an air hammer to detach the heavy layers of rust and also by requiring cutters to use a hand hammer whenever they encounter heavy rust while performing cutting operations. The destruction of underframes proceeds at the rate of about 2½ underframes per man per shift and is completed during the first shift. A gantry crane equipped with a magnet picks up the metal where it lies and carries it to nearby cars or to other sections of the scrap yard as directed.



Steps in Dismantling Car Trucks

Sorting and moving not completed during the day are performed by the night shift under flood lights so that the yard is completely cleared of all metal before the next day's batch of cars arrives.

100 Trucks Daily

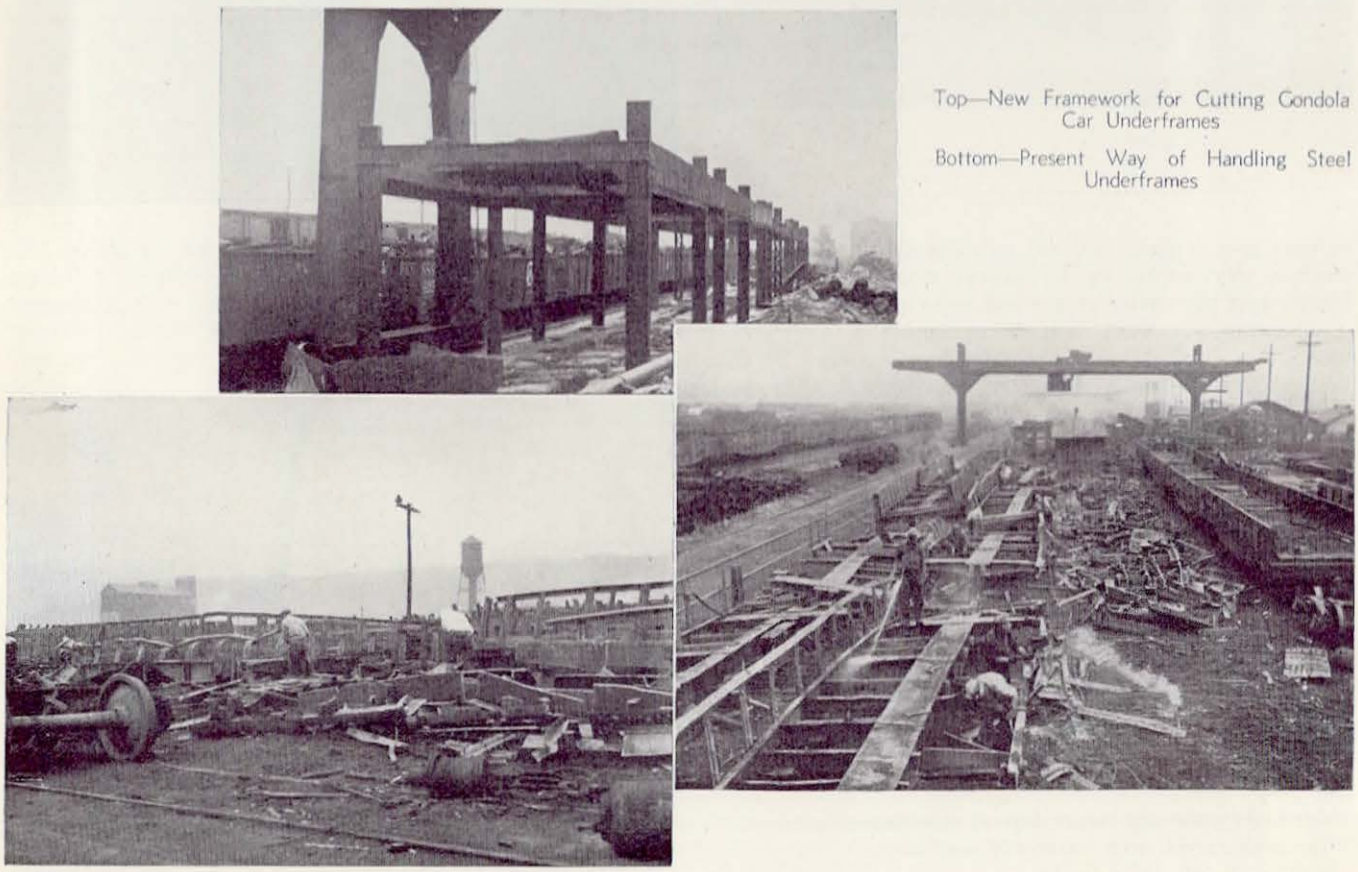
As the cars are destroyed and the ground cleared of material, the cars lose their identity, and all other work resulting from the dismantling is co-mingled with work performed at Conway or elsewhere on similar materials received from other sources. The Pennsylvania has a large wheel shop at Conway and also a truck assembly plant, and the dismantling of the trucks from the cars dismantled at Conway or cars dismantled at other points is governed to a large extent by the use of new trucks and wheels as well as by the rapidity with which old trucks can be dismantled. Trucks for cars, therefore, may go direct to the truck dismantling yard or into storage.

Truck dismantling is also a systematically organized operation, however, and is set up to handle 100 trucks a day. The trucks are placed upside down on a 600-ft. track where a gang of 20 men in two-man teams cut all bolts with torches and completely separate all parts. Since this track is not within reach of the gantry crane and does not produce a sufficient volume of scrap or reclaimable materials each day to load directly into cars, the arch bars, brake beams and spring planks are piled to one side and all small materials are sorted into containers made of cut boilers which are placed on each side of the dismantling track.

A locomotive crane places the containers under the gantry crane for disposition as scrap or for movement to the reclamation shop for inspection, further dismantling or reconditioning. Reclaimable materials which receive their final processing at Conway include brake beams and other brake rigging, couplers, bolsters and journal bearings, while air brake materials and pipe fittings are shipped to Altoona. Journal-box packing is shipped to the Pitcairn shops at Pittsburgh for reclamation. Coil springs, journal wedges, draft gears, etc., which are repairable are held at Conway subject to inspection and ultimate disposition as good material or as scrap.

High Dock for Underframes

Opportunity to improve on the dismantling operations is constantly being studied, and, at present, a steel scaffold has been completed at Conway for handling 24 car underframes a day, to reduce the cost of dismantling gondola cars. The scaffold consists of an assembly of columns and overhead girders made by welding together sections of steel from old cars and bridges to form an elevated grid on which four underframes can be placed end to end at one time and cut up so that the scrap will fall directly into cars spotted on a track below. The gas for burning is piped through overhead outlets, and walks are built for the safety of the burners. This arrangement will save about 12 hours on the time of cranes otherwise required to handle underframe scrap. A similar framework is being erected at Terre Haute.



Top—New Framework for Cutting Gondola Car Underframes

Bottom—Present Way of Handling Steel Underframes

Watch Costs

By time studies and close supervision, the details of the operations are watched closely, both to regulate the payroll cost of the scrap plant and to insure a profitable return on the work. All car dismantling, as well as the scrap handling and reclamation, is carried out under the direction of mechanical department officers and supervisors who have the responsibility of maintaining rolling stock under monthly expense budgets which are influenced so substantially by credits or debits growing out of the handling of scrap as to foster an acute interest in the question of scrap costs for both material and labor.

All weighing in and out of the yard is performed by an employee of the reclamation plant, and a representative of the accounting department is stationed at the plant to prepare all cost records. The separation of scrap into marketable grades and the volume of salvage permissible are determined only after consultation with and are policed by the purchasing and stores department which sells the scrap and is principally responsible for keeping the volume of unapplied materials at a practical minimum. The practice of furnishing the plant foreman with shipping instructions which show the sale price of each class of scrap is also regarded as an aid to efficient administration of the enterprise.

The plant at Conway is operated under the direction of M. R. Reed, general superintendent of motive power, Central Region, J. B. Diven, superintendent of motive power, Eastern Ohio division, and H. B. Chaffin, master mechanic, Eastern division, and is under the immediate charge of J. W. Bukey, foreman, co-operating with C. B. Hall, manager, Pennsylvania stores.

(The second and concluding installment will appear in an early issue.)

Finance Hearings a Lively Show

Wheeler keeps center of stage at "objective" inquiry, using witnesses only insofar as they corroborate him

WASHINGTON, D. C.

HEARINGS before a sub-committee of the Senate committee on interstate commerce in connection with its investigation of railroad finance were continued this week with further evidence regarding financial transactions of the various Van Sweringen companies.

As was the case during the first week the hearing was conducted largely as stage setting for testimony by Chairman Wheeler, from records gathered by the committee's investigators, including many statements condemning the practices dealt with, while the witnesses who had been subpoenaed were called on to confirm or supplement them, or often to state facts from memory to be covered later by detailed correspondence or records in possession of the committee.

On December 15 Commissioner Joseph B. Eastman, of the Interstate Commerce Commission, was called to express his views as to the accounting and financial significance of certain facts which had been presented regarding a contract made by the Missouri Pacific for the purchase of terminal properties from Terminal Shares, Inc., one of the Van Sweringen companies, regarding which he said, as Senator Wheeler had charged, that the Missouri Pacific accounting had presented a "false record," and which he criticized in other respects. "The transaction, considering its entire history," he said, "is an illustration of what may be accomplished through the excessively loose and indefensible practices in which we indulge in this country in the creation of corporations. The Van Sweringens created corporations at will for any desired purpose and gave birth to a multitude of them. The subject is too large for me to attempt any adequate discussion of it at this time, but I suggest that it is worthy of very careful consideration in connection with the investigation."

The commission has showed its interest in the proceedings in a letter to Senator Wheeler in which Chairman Mahaffie said he understood that the hearing was "developing information with reference to the actual control of railroads in the so-called Alleghany system, derived from sources which have not been available to this commission," and asked that the commission be furnished with a transcript of the hearing as soon as it was available.

Some of the facts brought out may aid the commission further in its determination as to whether the acquisitions by the Midamerica Corporation constituted a new control of the railroads that would bring that company within its jurisdiction.

For the benefit of newspaper men Senator Wheeler has been drawing "lessons" from the testimony to indicate the need for legislation to abolish railroad holding companies and make it impossible to use them to facilitate the acquisition of control over large properties with small investments. He also commented on testimony as to the use of "nominees" by the banks to hold railroad securities, saying that this prevented the Interstate Commerce Commission from ascertaining the actual control from the reports made to it of the largest stockholders.

On December 10 John P. Murphy, secretary of the Alleghany Corporation, was questioned at length as to the functions of the numerous companies which it controls. He was also questioned as to the purchase of certain terminal property at Kansas City and St. Joseph, Mo. for about $20,000,000 in 1930, which he said the Van Sweringen interests were desirous of acquiring for the use of the Missouri Pacific. He said it was purchased from the Armour and Swift interests in the name of the Geneva Corporation instead of direct by the Alleghany Corporation, because the latter was then buying Missouri Pacific stock and did not want its interest in the Missouri Pacific known. Later the property was assigned to Terminal Shares, Inc., and then transferred to the Missouri Pacific.

Financing of the Alleghany Corporation

W. C. Potter, chairman of the board of the Guaranty Trust Company, was recalled for further questioning regarding the flotation by the Morgan firm and the Guaranty Company of bonds, preferred stock, and common stock of the Alleghany Corporation, and as to the profits made by the bankers. It was brought out that much of the common stock was held by the bankers or privately sold at $20 a share while it was offered to the public at $24. Senator Wheeler said this was the same stock that was purchased by Midamerica at 14 cents a share, in 1935, and referred to it as "wildcat." Mr. Potter denied that it was in that class and said the Van Sweringens had acquired 2,250,000 shares of the common stock and in payment delivered securities of over $45,000,000 market value.

Senator Wheeler kept referring to the "unlimited" borrowing power of the Alleghany Corporation under

its charter but when Mr. Murphy was recalled on Monday he showed that the company's articles of incorporation provided for a limitation of its capital indebtedness to 60 per cent of the value of its assets. Mr. Potter said that the idea of the Van Sweringens was to build a great railroad system and that the bankers gave them a great deal of latitude because they had a great deal of confidence in them. When Senator Wheeler said that "things had been going on in the Van Sweringen railroad empire that ought not to be permitted," Mr. Potter said that if things were as the Senator had described them he would agree with him but on Monday he returned with a prepared statement to show that the Senator had not had a correct understanding of certain transactions.

Senator Wheeler insisted that the corporation had exceeded its borrowing capacity in 1930 when $10,500,000 additional was needed to complete payments on the terminal properties and arrangements were made with J. P. Morgan & Co., whereby the latter purchased that amount of Missouri Pacific convertible 5½ per cent bonds at par from the Alleghany and gave it an option, running to April 16, 1931, to repurchase the bonds at the same figure. At the time of the purchase the bonds were selling at 105½ but the Alleghany Corporation was unable to repurchase the bonds and the price fell so that the Morgan firm and the Guaranty Company, which participated to the extent of $3,000,000, faced a substantial loss. There was some argument as to whether this constituted a loan and Senator Wheeler produced bank memoranda in which it was stated that Messrs. Van Sweringen conceded that it was intended to be in the nature of a bank loan and that it was not contemplated that the banks should incur any loss in connection with it.

On Monday Mr. Potter returned to the stand with a statement he had prepared in an effort to give some direct testimony as to the facts in regard to the financing and the part that the Guaranty Company had in it, "so as to show that it differed fundamentally from the kind of situation which we were discussing on Thursday." He also sought to emphasize that the Van Sweringens had been trying to assemble a group of railroads in accordance with the consolidation policy adopted by Congress in 1920 and pointed out that the Interstate Commerce Commission in 1932, after having on several occasions partially approved and partly denied various applications filed with it by the Van Sweringen railroads, had finally adopted for Eastern territory, in its official consolidation plan, the grouping that the Van Sweringens "through a decade of intensive work had been struggling to assemble."

Statement By W. C. Potter

"As you stated at the hearing," Mr. Potter said, "Guaranty Company of New York participated in the sale to the public of Alleghany Corporation securities as follows: $85,000,000 of 5 per cent convertible collateral trust bonds, $62,500,000 cumulative 5½ per cent preferred stock with warrants to buy common stock attached and 500,000 shares of common stock at $24 a share, or $12,000,000. As indicated in the record this makes a total of $159,500,000, or $147,500,000 exclusive of the common stock.

"It is important to consider the three classes of securities separately. The $85,000,000 of bonds were in three issues. The Guaranty Trust Company was trustee under each issue, which was secured by the deposit of specifically described collateral worth at least $150 for each $100 of bonds. The collateral consisted as a whole of stock directly or indirectly representing substantial interests, if not control, of the important railroad systems which came to be known as the Van Sweringen railroads. Under the terms of the trust if the corporation failed to maintain this ratio of $150 to $100 it could neither declare dividends nor borrow except for current needs; and in addition the trustee was empowered to collect and hold for the bondholders all income from the collateral and also to vote the pledged stock. At the time of each of the three bond issues the assets of the corporation at current values were worth approximately three times the debt outstanding at the time of issue.

"We believed the bonds represented a sound investment. The record of the last six years demonstrates that this belief was well founded. Despite the greatest depression in the world's history, which has particularly affected railroads, two out of the three issues have continually paid their interest and are now selling at approximately the issue price. The third issue, where payment of interest in cash was suspended, is showing definite recovery. Taken as a whole the collateral for the three issues on November 2, 1936, was valued at $143,384,066, or nearly double the $77,791,000 of bonds outstanding.

"The Guaranty Company participated in the sale of $62,500,000 5½ per cent Cumulative Preferred Stock. With this stock every purchaser received warrants to purchase common stock at $30 a share in the case of the first two issues and at $40 a share in the case of the last issue. Stock is not a debt but a share in the ownership. If things go badly, the bondholder must be paid before there is anything for the stockholder.

"The charter of Alleghany protected the preferred stock by providing that after the first issue of $25,000,000, no more preferred could be issued nor more debt created unless the corporation had assets of a value of at least $100 for each $60 of debt and preferred. These clauses were inserted at the instance of the Guaranty Company as a protection to the preferred stock which it sold. The valuation of the assets for this purpose required approval of an officer of the Guaranty Trust Company.

"We did not foresee the depth of the depression nor the decline in values, particularly of railroad securities. However, even after the depression the assets of Alleghany had a value at last appraisal on November 2 equal to par for the bonds and over $88 a share for the preferred stock.

"The Guaranty Company also offered to the public 500,000 shares of common stock for $12,000,000 as compared with $85,000,000 of bonds and $62,500,000 of preferred stock. This was not all the common stock sold by the Alleghany Corporation. The Van Sweringens acquired 2,250,000 shares and, in payment, delivered securities of over $45,000,000 market value. In addition to the 500,000 shares of common which Guaranty Company purchased from J. P. Morgan & Co. and sold to the public J. P. Morgan & Co. purchased from Alleghany another 750,000 shares which they retained or sold privately at $20 a share. The common stock was not sold to an unwilling public by high pressure salesmanship. The Van Sweringens invested the greater part of their fortunes in it. The stock immediately rose in the market to the 30's and eventually to the 50's. It represented frankly an opportunity to join with the Van Sweringens in their railroad enterprises, with the opportunity for profit and a corresponding risk of loss.

"Some of the questions suggested that under its charter the Alleghany Corporation was given power to do too many things, among others, 'to borrow or raise money without limit' and to acquire securities of any corporation, domestic or foreign, or of the United States,

or any state, territory, or dependency of the United States or of any foreign government. It is important to know that the same instrument from which these provisions were quoted contains other provisions of a restrictive character, and that there were other definite restrictions in the indentures relating to the bonds, copies of which are in the possession of the committee. As to wide powers, it is common practice in the case of modern corporations to give them the widest powers.

"The Alleghany Corporation was designed primarily as a means of bringing about consolidation of the eastern railroads in which the Van Sweringen's were interested. These roads included all the so-called Van Sweringen Railroads, with the exception of the Missouri Pacific, which was purchased by the Van Sweringens to give Alleghany a diversification of earnings. In the light of hindsight, I believe the Missouri Pacific purchase was a mistake of judgment. But the main purpose of Alleghany remained the consolidation of the eastern roads.

"The activities of the Van Sweringen's in connection with the eastern railroads were founded on the policy favoring consolidations of railroads into a few great systems that was declared by Congress in the Transportation Act of 1920. This consolidation policy originated in Congress. After prolonged hearings, it received the endorsement of this committee and it became law with the signature of President Wilson. The desirability of railroad consolidations was repeatedly pointed out by each successive President, including President Franklin D. Roosevelt. The consolidations that the law envisaged were to be voluntary, initiated by the railroads, but in harmony with the ultimate views of the Interstate Commerce Commission. Messrs. O. P. and M. J. Van Sweringen rapidly became, in the early '20's, conspicuous figures in working for a realignment of railroads in the Eastern area. In 1932 the Commission in its official consolidation plan adopted the grouping that the Van Sweringens through a decade of intensive work had been struggling to assemble."

Mr. Potter also said that the stock pledged by the Alleghany Corporation with the Guaranty Trust Company was placed in the names of nominees because requirements as to delivery and exchange necessitated that it be done. This practice, however, he said, did not at all result in concealment of real ownership of that stock by Alleghany or of the fact that it was held in pledge by the Guaranty Trust Company. The publicity, both as to Alleghany's ownership and the holding of that stock by the Guaranty Trust Company, as pledgee, was widespread.

Senator Wheeler objected to the implication that the government was responsible for much that had been done, saying that the Van Sweringens had not been proceeding according to the policy of Congress and that holding companies had been used to defeat the policy. Mr. Potter said that he was no champion of holding companies but that they were frequently useful to accomplish something that is to be done. "Perhaps they were trying to accomplish the same ends in a different way," he said. He agreed that they had created a "very complicated situation." Senator Wheeler also pointed out that the Van Sweringens had used money borrowed through the Alleghany Corporation to purchase stock of the Missouri Pacific.

It was brought out that from May, 1931, to May, 1935, the Van Sweringens had made no cash payments for interest on the loans of $39,500,000 from the banks but Mr. Potter said they had given notes.

On December 14 Senator Wheeler brought up again the subject of the purchase of the terminal property, which was later sold to the Missouri Pacific. He contended that the sale was in violation of the Clayton law and also of a Missouri statute because it had been accomplished without authorization from the Missouri commission. Mr. Murphy said the statute was not applicable to a transaction accomplished outside of the state.

Sale Of Terminal Property To Missouri Pacific

All of Tuesday's session was devoted to a discussion of details of the Missouri Pacific's accounting for payments of $3,200,000 to Terminal Shares on account of its contract to purchase the terminal properties, subject to I. C. C. approval as to the acquisition of certain railroad properties included. The records produced showed that although this money was disbursed by the Guaranty Trust Company to Terminal Shares for its own purposes and for the purposes of the Alleghany Corporation, the Missouri Pacific had carried it on its books as "current assets-special deposits." When Mr. Potter said he did not know about it, Max Lowenthal, counsel for the committee, read into the record transcripts from the journal entries covering the accounting in detail. William Wyer, secretary and treasurer of the Missouri Pacific, was asked to state that the amounts had been so reported, which he did, but was not given an opportunity for any explanation.

Senator Wheeler then called Commissioner Eastman, who said he had been given an opportunity to review the records of the committee bearing on the transaction. He read a statement reviewing the various details, including the following:

Eastman Finds Incorrect Accounting

It should be noted that these contracts between the Missouri Pacific and Terminal Shares, Inc., were made by companies which were under common control. It should also be noted that while the original contract to purchase the securities from the packers was made prior to the stock market crash of 1929, these later intercompany contracts were made at the end of 1930, when the prices of securities generally had fallen greatly. Nevertheless, the Missouri Pacific was obligated by the contracts to shoulder the full financial burden of the amount which it was agreed to pay the packers in 1929, and which they later received.

Summing up the contracts, they were a means of shifting this burden in full to the Missouri Pacific, ostensibly through sales of the securities to it but without certainty that the commission would permit such sales. They were so drawn that if the commission refused the necessary authority, nevertheless the Missouri Pacific was left holding the bag and in a position where it must protect Terminal Shares, Inc., from any loss.

I come, now, to the matter of accounting. As I have explained, the full amount involved was $20,334,264, but with respect to the liability of the Missouri Pacific it was divided, in effect, into two items, $15,965,201 and $4,369,063. To the extent that the Missouri Pacific was financially responsible, Terminal Shares, Inc., was certain to get the first of these amounts, plus interest from the date of the contracts. It was not so certain to get the second of these amounts, for it could rely upon the guaranty of the Missouri Pacific only in the event that the latter was unable to purchase the securities of the North Kansas City Bridge and Railroad Company and the land company securities. On its books Terminal Shares set up the $15,965,021 as an account receivable, and it accrued interest thereon. As the quarterly payments of $400,000 each were deposited to its credit by the Missouri Pacific, it took these amounts and applied them partly to accrued interest and partly to principal. This was, I believe, correct accounting.

The Missouri Pacific did not set up the $15,965,021 as an account payable (nor as any kind of a liability), nor did it accrue against its income account any interest thereon. It accounted only for its quarterly payments of $400,000, the total of which finally aggregated $3,200,000, and it set these amounts up among its current assets as "Special Deposits." Under no sound theory could these amounts be regarded as such "Special Deposits." They were deposited to the credit of Terminal Shares, Inc., and were at once taken and used by it. The accounting resulted in a false statement of the Missouri Pacific's current asset position. When the Bureau of Accounts of the Commission later examined the books of the Missouri Pacific, it required these amounts to be transferred to "Other Unadjusted Debits." This

was correct accounting, if the payments were to be regarded as made on account of a contingent liability for a purchase which might or might not be made, and which liability would not be definitely created unless the purchase were made. On this theory, the payments were made, like option payments, to secure the right to purchase in the event of a certain contingency, and upon definite disappearance of this right they would have been written off as a loss.

Upon their faces, the contracts were capable of such a construction. The Bureau of Accounts, however, had no means of knowing of the legal opinion which had been given to the Guaranty Trust Company or of how the results of the contract had been accounted for by Terminal Shares, Inc., or of what had been done with the cash by the latter. As a matter of fact, so far as the $15,965,021 and yearly interest thereon were concerned, the Missouri Pacific's liability was not contingent but definite and direct, apart from the possibility of having violated the Clayton Act or other law. The right to purchase was contingent upon action by the Commission, but not the liability for the purchase price. The $15,965,201 should, I believe, have been set up on its books as a deferred liability, to be reduced as payments of this principal amount were made; interest on this amount, to the extent that the purchase price remained unpaid, should have been accrued each year against the income of the Missouri Pacific; the quarterly payments should have been applied in part to the payment of this interest and in part to the reduction of the deferred liability; and in the assets, under "Other Deferred Assets," a balancing item of $15,965,201 should have been set up, to be transferred to "Investments in Affiliated Companies" when the purchases were consummated. The contingent liability with respect to the other item of $4,369,063 should have been fully explained in a note to the balance sheet in the annual report to the Commission.

The accounting by the Missouri Pacific which I have thus outlined would have been the appropriate obverse of the actual accounting of Terminal Shares, Inc. The result of the incorrect accounting was that the Missouri Pacific presented a false record of its current assets, of its liabilities, and of its income account. It was enabled to make this false showing to its advantage at a time when it was in great financial peril. On the other hand, Terminal Shares, Inc., by correct accounting, was able to make a showing likewise to its advantage.

So much for accounting. You have also asked me to comment on the financial aspects of the transaction. The transaction was of such a nature at to defeat, in certain respects, the Commission's jurisdiction over the acquisition of control of one railroad company by another. These contracts between the Missouri Pacific and Terminal Shares, Inc. were so arranged that the Commission could prevent the acquisition, if evidence warranted such action, but could not in practical effect, either in that event or if it approved the acquisition, extricate the Missouri Pacific from full liability for the purchase price. In other words, the Missouri Pacific was by the contracts made financially responsible to Terminal Shares, Inc. for the amount of the purchase price.

There have been other instances of such contracts, and they seem to be growing in favor. In my judgment, they are contrary to the public interest and should be prohibited by law.

At the conclusion of Mr. Eastman's statement Senator Wheeler declared the hearing adjourned until the following day at an hour earlier than the usual adjournment. P. J. Mulligan, of counsel for the Missouri Pacific, protested, saying he hoped that the inquiry would at least permit an opportunity for witnesses who had been subpoenaed to make an explanation, as there were two present who could testify that the accounting was correct. Senator Wheeler said that Mr. Wyer and F. P. Johnson, chief financial and accounting officer of the Missouri Pacific would be called later but that he did not propose to be told when. Mr. Mulligan said it was unfortunate that the testimony should be broadcast without an opportunity for explanation and that Mr. Eastman had stated that he was neither an accountant nor a financier.

On December 16 Mr. Johnson was allowed to explain the theory on which he had accounted for the payments as special deposits, under the commission's accounting rules which include under that head "funds specially deposited for payment of debts," or "other deposits of a special nature." He pointed out that the Terminals Shares contracts were rather unwieldy and hard to understand and when the matter was first presented to him he pointed out to the law department the advisability of obtaining the approval of the commission for the acquisitions because in the absence of such approval he could not set up on the books the securities purchased or the property acquired. When the first payment of $400,000 was made it was necessary to put it on the books somewhere and, thinking the matter would soon be settled, he put it in as "unauthorized work." However, after $800,000 had been paid and there did not seem to be any possibility of an early decision from the commission because the applications had not been filed he placed it under the head of "special deposits," saying he had exercised his own judgment, just as Mr. Eastman had. He also pointed out that Mr. Eastman had outlined only a temporary method of accounting. In May, 1933, the director of accounts of the commission had questioned the accounting and after being furnished with copies of the contracts had instructed that the payments should be included in "other unadjusted accounts."

Mr. Johnson said that if he had known as much as he had since learned, that the payments were immediately disbursed by the banks to the Terminal Shares and Alleghany companies, and accounted for on their books partly as interest income, he would not have carried the item as a special deposit. Senator Wheeler produced a copy of a memorandum signed by Mr. Wyer saying that Herbert Fitzpatrick, vice-president of the Missouri Pacific, believed the payments should be shown as special deposits, final adjustment as between interest and principal to be made when the properties were definitely acquired. It was stated that Mr. Johnson had been so advised by telephone. Mr. Johnson said that it was merely good advice to him and that the responsibility was his.

Senator Wheeler said he appreciated the difficulty an accountant might have had "in getting the facts out of that crowd in Cleveland" and kept repeating that the Van Sweringens and the lawyers must have known that the books of the Terminal Shares and the Alleghany companies were showing income received which the Missouri Pacific books did not show as having been paid. When he emphasized that the Van Sweringens and the same law firm were acting for both buyer and seller, Thomas H. Jones, of the law firm of Tolles, Hogsett & Ginn, denied that the firm had acted for the Missouri Pacific in the transaction, saying the Missouri Pacific had its own law department. Senator Wheeler said the facts and the record spoke for themselves so loudly that the denial would not be heard but Mr. Jones retorted that "the Senator speaks more loudly than the facts."

Mr. Johnson said that after Judge Faris had ordered the trustee to try to have the contracts set aside and to recover the money paid he was of the opinion that his accounting was "not so bad," and that "the statements made yesterday were unjust at least to my company." "I understand," he said "that lawyers don't always agree and you cannot expect accountants to." Senator Wheeler insisted that he should have set up the entire amount as a liability without waiting for the commission to act but Mr. Johnson said the exact amount could not be determined in advance.

Mr. Wyer asked for about 20 minutes in which to make his statement but Senator Wheeler asked so many questions while he was reading it and disputed so many of the statements that it took nearly two hours. He told of having been advised by Mr. Johnson that the first payment was being recorded as "unauthorized work" and then taking up the matter with D. S. Barrett, assistant to O. P. Van Sweringen, and with Mr. Fitzpatrick, who had suggested that he take it up with E. M. Thomas, comptroller of the Chesapeake & Ohio. Mr. Thomas

showed him where the C. & O. had reported similar items as special deposits and said that in his opinion that was the proper place to carry the item. Mr. Fitzpatrick concurred and he then expressed the same opinion to Mr. Johnson. The payment to the bank, he said, did not alter the fact that the Missouri Pacific had made an instalment payment on these contracts and was entitled to a credit in the amount paid in the final adjustment of the purchase price. There was never any question in his mind, he said, as to the correctness of the accounting until a conversation he had with Commissioner Mahaffie in December, 1932, when he questioned the propriety of the account but Mr. Wyer thought he had convinced the commissioner it was correct. He said it was no concealment of the facts and had appeared in the press over a long period of time. Subsequently the Bureau of Accounts corresponded with Mr. Johnson and after considering the matter for practically a year suggested that the amount be transferred to "other deferred assets," which still did not change the showing of the item as an asset of the Missouri Pacific. "Railroads under the Interstate Commerce Commission accounting rules," he added, "are permitted to show as the cost of their investments in securities of other companies interest paid in connection with a purchase contract up until the date when the purchase is completed."

Diesel Conversion of Gasoline Rail Car

AN INTERESTING conversion of a Brill model 75 gasoline-powered rail car to Diesel power is that of an installation recently made for the United Fruit Company for service in Cuba. The car on which this installation was made is one which has been in service for several years on a railroad in the United States.

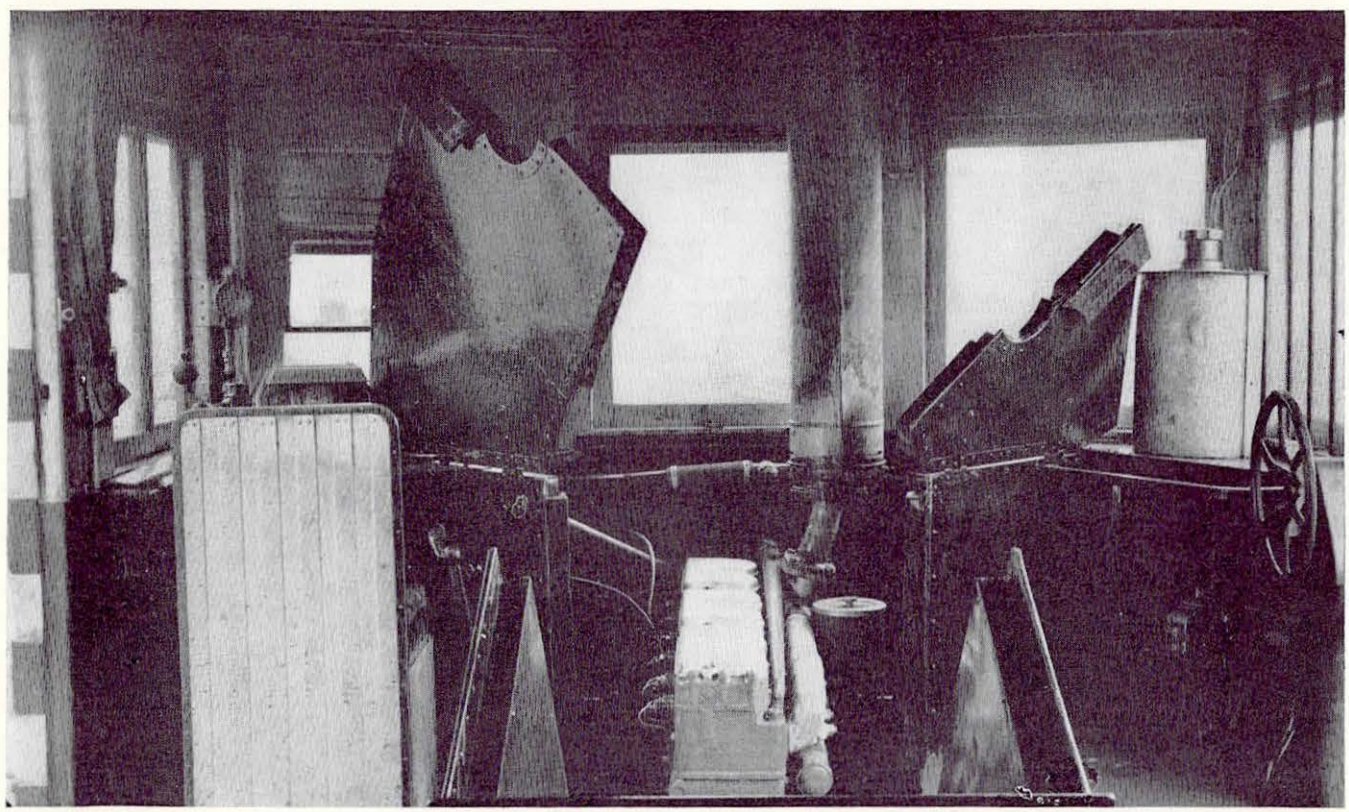
This particular car has a total length over the end sills of 55 ft. and a total weight of 61,500 lb. As originally built it was equipped with a Winton six-cylinder four-cycle gasoline engine devolping 190 hp. at 1,300 r.p.m. The transmission is of the mechanical type having five speeds forward and in reverse. The job of converting this car to Diesel power involved the replacement of the gasoline engine by a Cummins Engine Company's model HB-6, six-cylinder four-cycle Diesel engine developing 150 hp. at 1,800 r.p.m. With the Diesel engine the re-equipped car weighs 60,200 lb. and is designed to be operated, when necessary, with a trailer weighing 50,000 lb. The mechanical transmission is retained; the Diesel engine being connected in the same manner as the original gasoline engine.

The Diesel Engine

The engine with which this converted car is equipped is one which has been especially designed for transportation service. It has a piston displacement of 670 cu. in., is of the overhead valve type and is equipped with a fuel distribution and injection system of especial interest.

The crankcase and cylinders are cast en bloc with removable cylinder liners. The cylinder heads are cast in pairs. The pistons are of chrome-nickel furnace iron having full-floating piston pins and four piston rings. The crankshaft, 4½ in. in diameter, is of chrome-nickel-molybdenum steel and is mounted in seven main bearings. The connecting rods, 12 in. center to center, have removable bearings 3⅛ in. diameter by 2⅜ in. long.

In the Cummins fuel distribution system a gear pump draws the fuel from the supply tank, passes it through the filter and delivers it to the fuel distributor pump which operates against a low-pressure because the injection pressure is developed by the cam-operated plunger in each injector. The fuel is metered by a single-plunger pump which measures the fuel charges for all the cylinders. Once measured, these charges are distributed, each



Cummins 150-hp. Diesel Engine Installed in Brill Model 75 Rail Car to Replace a Gasoline Engine

to the proper cylinder, by a revolving distributor disc. The amount of fuel oil which is delivered to an injector is determined by the length of the stroke of the single-plunger pump. Any wear in this pump affects all cylinders alike and does not unbalance the engine.

In the Cummins injector nozzle the fuel charge is held suspended in a small cup, resembling a cone-shaped thimble. Through the holes in the bottom of this cup the air in the combustion chamber passes up through the fuel as the injector plunger rises during the compression stroke. A small quantity of hot air is thus mixed with the liquid fuel charge, changing it to a gaseous mixture too rich to burn in the injector chamber. At the moment of injection the cam-operated plunger is depressed, forcing the gasified fuel charge directly into the cylinder through the several openings in the injector nozzle. Since a rich gas and not a liquid is being injected, rapid burning is assured, as all that is then necessary to assure instant ignition and smooth burning is the additional oxygen contained in the compressed air already present on top of the piston in the cylinder.

This converted rail car is designed to maintain an operating speed of 15 m.p.h. on a 1.5 grade with car and trailer fully loaded.

Communications . . .

Education of Staff a Vital Need on the Railroads

IVORYDALE, OHIO.

TO THE EDITOR:

I have noticed within the past few months that your paper has published a number of articles dealing with the educational activities of various railroads, the purpose of which, is to improve the background of their personnel. This is a step in the right direction.

With keen competition on every hand we cannot stand still, but must press forward or be driven back. To go forward we must not only furnish better service at lower costs, but also avail ourselves of every modern improvement; and in any improvement program railroad personnel should not be overlooked. The time has passed when railroads can afford to have a large portion of their employees unthinking cogs in the transportation machine.

Expert Analysis the Need of the Day

The special opportunity for the railroad man today is in the very disorder of the world about him. At no time has the world of economics been so fascinating a laboratory for thoughtful men. Never before have our arteries of communication been so open to analysis. And the railroads which form the very foundation of our system of communication, as well as the most important single element in our social and economic life will welcome expert analysis in all departments. Educational programs sponsored by the rail carriers should assist the young men, the ones who will have to solve the transportation problems of tomorrow, to analyze the railroad situation in a more satisfactory and intelligent manner, so necessary if we are to remain a private business enterprise.

The solving of these problems in a satisfactory manner requires three things, knowledge, vision, and courage. Vision suggests and beckons; knowledge decides and directs; courage executes. The determining and most important factor of the three is knowledge. *Vision and courage are inborn, but knowledge comes only through acquirement.*

One plan which should make for a more intelligent and a better average type employee would be for the carriers to provide financial assistance to those showing an aptitude for the work, and who desire to enroll in approved educational institutions for evening courses which will better fit them for their work. This might take the form of a partial refund upon successful completion of the work, and would be limited to courses of value, and only to those employees who will make the most of the opportunity.

Under this plan a survey would be made, and all department heads furnished a list of rules and regulations, and also a list of approved institutions offering evening courses in residence. The department head would be the final judge in the matter of selecting those employees entitled to the privilege.

According to a survey made by the Industrial Section of Princeton University, some of the companies having educational refund plans for their employees are: Consolidated Gas Electric Light & Power of Baltimore, Eastman Kodak Company of Rochester, N. Y., Philadelphia Electric Company, Public Service Company of New Jersey, Socony Vacuum Company, New York, Standard Oil Company of New Jersey and New York, and the Tide Water Oil Company, New York.

"Money Well Spent"

The following statements are from companies with comparatively long experience with such plans:

"There is considerable evidence that employees who have completed courses under the plan have improved their own status and have increased their value to the corporation. All in all, our experience has been satisfactory and we feel it is money well spent.

"We feel that our experience with the plan justifies its continuance and in many ways supplements our own company training work. The majority of employees remain with the company, and undoubtedly these outside courses have been the means of developing executive and technical ability."

Co-operation between the railroads and the many excellent schools offering traffic, transportation and other courses of value in residence, at night, should prove profitable to the carriers. The writer made a survey of evening courses offered by leading universities in such railroad centers as New York, Chicago, Cincinnati and St. Louis. Among courses they give which would prove of value to railroad employees are: Traffic Management, Transportation Economics, Public Speaking, Purchasing, Business Psychology, Human Relations, Accounting, Business Writing, Economics and Salesmanship. There are also a number of technical courses offered in the evenings.

The present need is not for outside experts, but for alert, practical railroad men with a full vision of their opportunities and responsibilities. The industry is blessed with a number of talented and versatile young men, who, with the proper assistance and encouragement might surprise managements with their capabilities.

E. J. DENNEDY.
Office of Division Storekeeper, B. & O.

Which One Is Right?

TOPEKA, KANSAS

TO THE EDITOR:

May I, in this way, express the hope that you may call the bluff of one Alexander Wilder, whose rantings on railroad service found space on page 766, your issue of November 21 and ask him for details of just a few of the 'innumerable incidents' in which the 'comfort, speed and service to which I feel and know my money entitles me,' were not forthcoming in his extensive travels.

I too travel, not commuting 5000 miles a year, but in long distance trips aggregating ten or twenty times five thousand miles, and have never yet failed to get on any American railroad the comfort, speed and service to which I felt my money entitled *me;* the difference in our perspective may be explained by the fact that I have no gall bladder disorder.

E. MCBRIDE.

NEWS

Industrial Mobilization Plan and the Railroads

Would operate under "own leaders" as directed by Administrator of War Resources

Legislation providing for an Industrial Mobilization Plan for use in the event of a war has been proposed in a report released by the War Department with the approval of the acting Secretary of War and the Secretary of the Navy. Under the head of transportation the plan as outlined proposes that transportation facilities, including rail, highway, inland waterways, pipe lines, and airways, shall operate "under the management of their own leaders, as directed by the Administrator of War Resources." The principal measures available to insure the necessary coordination in use and operation of transportation facilities, the report says, "are the establishment of priorities and embargoes."

The plan proposes the organization of a transportation division of the Army and Navy Munitions Board, with functions "to coordinate requirements for transportation and communication facilities necessary to support joint plans of operations and to recommend suitable action to insure adequate transportation and communication service for producing and delivering military supplies in time of war."

"The transportation agencies should operate under the coordination of their own leaders," the report says. "War and other emergency powers assigned to existing federal commerce control agencies by congressional legislation should continue to be administered by such bodies, in cooperation with the chief of this division.

"The transportation division exercises control over all modes of commercial transportation in the zone of the interior and over all uses thereof. Its functions are as follows:

(1) To formulate policies relative to the employment of the transportation facilities of the country.

(2) To establish, under approved policies, rules and regulations to govern the operation of the Nation's transportation facilities and their use by shippers.

(3) To effect such control as may be necessary to insure the most efficient use and operation of transportation facilities. This control is effected by means of the rules and regulations mentioned in paragraph 2, through the agency of war-service committees and in co-operation with established federal regulatory bodies. The use of transportation facilities by government agencies is also governed by the rules and regulations established by this division."

The report says that the Interstate Commerce Commission should continue to regulate transportation rates and that "representatives of this commission and of the War Labor Administration on the Price Control Commission should serve to maintain a proper balance between commodity prices, utility rates, and wages."

New Motor Freight Classification

The American Trucking Associations, Inc., has filed with the Interstate Commerce Commission a new National Motor Freight Classification No. 2, providing approximately 1,800 changes in ratings, to become effective on December 24. Changes were designed chiefly to bring about uniformity between less-than-truckload ratings in the East, South, and West for ratings of third class and higher. The new classification is a book of 400 pages, combining in one volume both less-than-truckload and volume ratings, and contains over 10,000 items.

Christmas Travel Expected to Set Records

The Pennsylvania and the New York Central are making plans to handle a record volume of passenger traffic over the Christmas holidays. The former has issued a statement saying that travel into and out of Pennsylvania Station, New York, between December 15 and January 4 "is confidently expected to eclipse all previous records" at that station which was opened 26 years ago. In a similar statement L. W. Landman, general passenger traffic manager of the New York Central, said that his road "is making preparations to handle the largest holiday traffic in its history."

Heavy Christmas Shipments by Air Express

The "unprecedented" volume of Christmas shipments by air express has forced the Air Express division of the Railway Express Agency to convert regular passenger planes into exclusive express planes, according to an announcement issued this week. The daily average number of shipments thus far in December has shown an increase of 133 per cent over the daily average for December a year ago. Meanwhile express service is also being maintained on combination passenger and express planes, of which there are 96 regularly scheduled serving the New York area daily.

Seek to Stop the Abuses in Automobile Caravaning

Action recommended at conference of regulatory authorities of 11 Western States

Drastic action to correct the abuses prevalent in the caravaning of automobiles over the highways was recommended by the Fourth Region of the American Association of Motor Vehicle Administrators, representing 11 western states, at a conference at Sacramento, Cal., on December 14. In a resolution adopted, representatives of the states assembled agreed to exchange data, reports and all needed information and to co-operate in the efficient administration of state and federal laws in an effort to collect compensation for the use of public highways, to protect innocent purchasers of automobiles and to prevent the burdening of relief rolls by imported drivers. In addition to this resolution the Committee on Caravaning recommended legislation including the taxation and regulation of caravan operators.

The resolution adopted is as follows:

Whereas it is the unanimous opinion of the representatives of the western states that the business of caravaning automobiles over the public highways for sale or demonstration is a commercial use of the highways which is of distinct value to those who caravan, and that those who engage in the practice should be required to pay to each of the states through which they operate reasonable sums as compensation for the use of the public highways and to defray the cost of necessary police regulation, and

Whereas the business of caravaning is reported to this convention as being subject to manifest abuses prevalent in varying degrees at various places, including practices facilitating sale to innocent purchasers of automobiles as new, when in fact they have been used, the practice of importing as drivers or passengers indigent individuals who become burdens on relief rolls and the practices resulting in fraudulent or irregular registration, and

Whereas it appears that inquiry should be made into the alleged existence of such conditions by administrative and legislative officials of the states affected,

Now, therefore, be it resolved that the representatives of the states here assembled do hereby agree to exchange data, reports and similar information and to co-operate in the efficient administration of state and federal laws pertaining to the subject.

Beatty Warns Against Over-Rapid Innovation

Says improvements ought not be introduced until certain of keeping them

There is no room in sound railway policy for "wild-eyed enthusiasm," in the matter of streamlined trains or other improvements which cannot be maintained generally throughout the whole service, Sir Edward Beatty, president of the Canadian Pacific, told members of the Canadian Railway Club in Montreal this week.

"If we put improved equipment into service in order to gain publicity, we should be pretty careful to assure ourselves that it is a standard which we can maintain," said Sir Edward.

"We are engaged in a big and difficult task when we come to provide transportation for a nation, and we must show caution as well as courage in handling our problems," the speaker declared in another portion of his address.

Sir Edward also saw the trend of "those who seek influence in our public life to speak lightly of such ancient virtues as honesty." Talk of repudiation, he said, "strikes at the very foundations of our social and economic system. The whole system of our society is based on something called credit, and credit is merely confidence. Should the people of this country begin to doubt the good faith of the public authorities, the consequences to you and yours will be most serious."

The limits to which railwaymen, from the highest to the lowest, go to obtain co-operation among themselves was outlined by Sir Edward at the outset of his address.

"The wisdom of railway co-operation in Canada was not discovered in Parliament, but by railway officers.

"In periods of intense competition, the railways do fight—sometimes rather against their wishes. Most of the time—especially in recent years—we are more interested in how to co-operate than how to score off each other. I know of nothing which has done more to prevent the great economic waste produced in North America during the past two decades by extreme and unregulated competition in transportation."

Discussing the relation of railroads to their customers, Sir Edward continued:

"It is useless to deny there was a time when the standard attitude of the railways was not always quite in accordance with the best traditions of salesmanship. In recent years we have all made a very definite attempt to cure this defect. We have tried to study the convenience and the wishes of our patrons. We have improved our salesmanship. We have gone into new methods of publicity.

"Partly I trust that this reform was produced by our own increasing common sense, and growing ideals of courtesy and good conduct. Partly—there is no reason to be ashamed of this admission—we have reformed because we found we were suffering the consequence of our own sins." However, said Sir Edward, "it is possible for even railway men to reform themselves too thoroughly."

After discussing railway improvements in Great Britain and the United States, the Canadian Pacific president went on to say that while the new streamlined trains in these countries are the most profitable trains on their respective systems, "we do not run railways on the basis of individual trains, but as whole systems of transportation."

He declined to criticize the railway systems of the other countries, the speaker continued, but: "Were we in Canada, in attempts to improve our service, to provide very high-speed trains with unusual luxury in the way of service, we might readily fill those trains by taking passengers from our other trains, which we might still be forced to maintain. As a result, an analysis of the profits of each train might show that the new luxury high-speed trains were highly profitable, and the older types of trains, as a result of this diversion of traffic, were now very unprofitable. We might, by this improved train service, increase the total gross and net revenues of our railways, but we should certainly have to be guided by total revenues, and not by pretty figures produced by a single train."

R. R. Credit Corporation Has Returned 68 Per Cent

The Railroad Credit Corporation on December 15, made its thirty-sixth liquidating distribution to participating carriers, amounting to $735,407, or 1 per cent of the contributed funds. Of this amount $381,364 was paid in cash and $354,043 was credited on carriers' indebtedness to the corporation.

This brings the total amount distributed to 68 per cent of the fund or $50,007,682. Of this total $24,376,467 has been returned in cash and $25,631,215 in credits.

Safety Lessons for School Children

The Committee on Education, Safety Section, A.A.R., has issued for the use of safety committees in the month of January a poster and circular combined, the feature of the poster being a picture of a scene in a court room, where some boys and girls, and also older persons, have been brought in to receive a special lesson in safety on railroads; the "lesson" being a boy, seated high on a pile of books, to serve as an object lesson illustrating the danger of "jumping trains." The boy has lost a part of each leg and his experiences are the subject of a short lecture by the judge. Emphasis is laid on the ball games and other things which the boy has missed in his short life.

Put in soberer terms, the lesson is based on the government records, showing that in the 13 years, 1923-1935, an average of 1,235 persons under 21 years of age have been killed or injured, on the railroads of America, while trespassing on railway property. The only possible lighter feature in the record is that the average per year in the last five years (1,293) is slightly less than the average per year in 1923-1927.

The bulletin is to be circulated in schools and other suitable places.

I.C.C. Hears Arguments on Surcharge Extension

Three days devoted to presentations on behalf of railroads and protesting groups

Three days were devoted by the Interstate Commerce Commission last week to hearing arguments on the petition of the railroads for a continuation after December 31 of the temporary emergency freight charges authorized by the commission in Ex Parte No. 115, pending hearings and a determination by the commission on the railroads' proposal of a rate readjustment plan designed to preserve a considerable part of the $10,000,000 a month revenue that has been derived from the "surcharge." The railroad argument was presented by R. V. Fletcher, vice-president and general counsel of the Association of American Railroads, and Elmer A. Smith, general attorney of the Illinois Central, and their position was also supported by Douglas Smith, counsel for the Security Owners' Association. Objections to continuation of the emergency charges were voiced by a score or more of representatives of shippers and state commissions, while A. H. Brown, representing the Cleveland Chamber of Commerce, favored continuation if several "obvious discriminations" were eliminated.

To show that the surcharges have not interfered with the movement of traffic Mr. Fletcher referred to a comparison of railroad carloadings for the first 48 weeks of 1936 with those for the corresponding week of last year, showing an increase of 14 per cent, pointing out that in some commodity classifications the increases have been as much as 40 to 50 per cent, while in others on which the surcharge was not generally applicable the increase was smaller. He said it was apparent that economic forces superior to any authority have been responsible for the increase in business reflected by this statement, regardless of the effect of the surcharges. Commissioner Eastman remarked that the total increase in industrial production, as indicated by the Federal Reserve index figure of 109 for September, 1936, as compared with 90 for September, 1935, and 79 for September, 1934 (based on 100 for 1923-1925), had increased more than railroad traffic. Mr. Fletcher replied that railroad revenues are still far below those of 1923-1925, saying he suspected that a great deal of traffic had been permanently diverted, regardless of the rates, partly because of relocations of industry in such a way as to call for less transportation by any means. He also called attention to statements issued by the National Coal Association, one of the most vociferous protestants, pointing to the large increase in coal production and even to the possibility of freight car shortages. Mr. Fletcher said he was not sure that this alarm was entirely without foundation but he pointed to the recent large increase in railroad purchases of equipment and said that an adverse decision by the commission might stop this desirable purchasing program or cause it to be greatly revised. He

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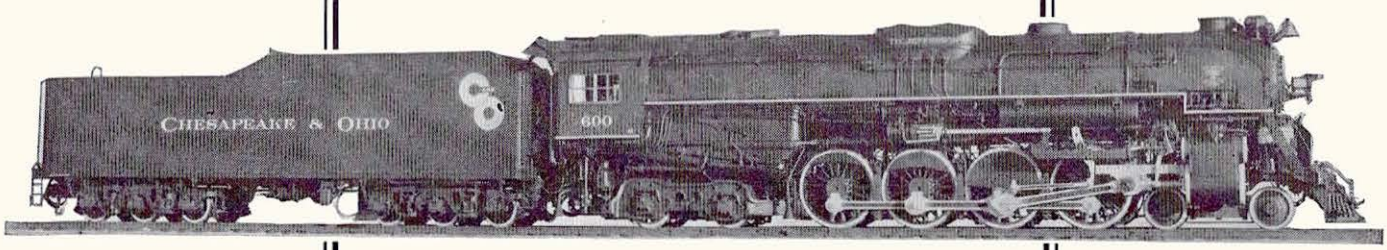
LOCOMOTIVE HORSEPOWER

determines...



LOCOMOTIVE EARNING CAPACITY

Higher speeds with capacity trains can only be had with high sustained locomotive horsepower.

This calls for generous boiler proportions, high boiler pressure, high superheat, large grate area, proper steam distribution, light reciprocating and rotating weights.

This combination can only be obtained in new locomotives.

LIMA LOCOMOTIVE WORKS, INCORPORATED, LIMA, OHIO

LIMA LOCOMOTIVE WORKS INCORPORATED

emphasized that no permanent increases in rates are involved in the present proceeding, saying the practical question is only whether the status quo shall be maintained pending the inquiry the commission is to make as to permanent rates.

Estimating the net income of the Class I roads for the first ten months of 1936 at $88,793,814 Mr. Fletcher said that the additional revenue from the surcharge for that period was approximately $99,521,000, so that without it there would have been a deficit, and he illustrated the point by saying that the additional revenue had so strengthened the New York Central that it was able to discharge its entire indebtedness to the government recently, whereas without it that desirable result could not have come about.

Commissioner Eastman said that another element in the sequence of events was the reduction in passenger fares and asked if the railroads were any more certain as to the effect of the surcharges than they were as to the effect of the cut in passenger fares. Commissioner Porter also asked how the greater increase in passenger traffic than in freight traffic could be accounted for. Mr. Fletcher replied that it was his conviction that the reduction in fares did not produce the increase in traffic so much as the greater desirability of the passenger service but he said the railroads were not all of one mind on that point and that the Baltimore & Ohio, which favored the fare reduction, "sincerely and prayerfully wants these surcharges."

The shippers' arguments were much the same as those in previous hearings in this case, except that some of them contended that the railroads were no longer facing an emergency because their traffic and earnings have been increasing by "leaps and bounds." It was argued that the roads have had time enough to readjust their rate structure, that it should be reduced rather than increased, that continuation of the surcharges would cause further diversions of traffic to trucks, and that many railroads should be reorganized so that they would not have to pay so much interest.

Charles F. Horsford, Jr., chairman of the National Bituminous Coal Commission, appeared in opposition to any continuation of the emergency rates on coal, saying the commission might well consider the reasonableness of the general level of bituminous rates and institute a general investigation in which not only increases, but also reductions, in the basic rates on coal would be considered.

Club Meetings

The Car Foremen's Association of Chicago will hold its next meeting at LaSalle Hotel, Chicago, on Monday evening, January 11. There will be a discussion on the new A.A.R. rules of interchange.

Charles B. McManus, traffic manager of the New York, Ontario & Western, spoke on "Competitive Traffic" at a meeting of the New York chapter, Railway & Locomotive Historical Society, Inc., held on December 11 in Room 1101 of the Engineering Societies building, 29 West 39th Street, New York.

The next meeting of the Metropolitan Traffic Association of New York will be held on January 14, 1937, at which time the second class in the Association's series of lectures will be conducted. The subject of the lecture, to be given by John Bowie of the McLellan Stores Company, will be "Terms and Conditions of the Bill of Lading." The program for the meeting will include the showing of a motion picture sponsored by the Frosted Foods division of the General Foods Sales Company. E. E. Wilson, chief rate specialist for that company, will discuss the picture's subject from a traffic standpoint. The annual dinner of the Association will be held at the Biltmore Hotel on February 11, 1937.

Chicago Special Agents Hold Annual Banquet

The Chicago Railway Special Agents' & Police Association held its annual banquet at the hotel Sherman, Chicago, on December 10. The principal speakers included Henry A. Scandrett, trustee of the Chicago, Milwaukee, St. Paul & Pacific; Judge Joseph A. Graber of the Municipal Court; and Hinton G. Clabaugh of the Chicago, North Shore & Milwaukee.

N. I. T. League Opposes Freight Rate Increases

The National Industrial Traffic League, on December 11, filed two petitions with the Interstate Commerce Commission, one seeking suspension of the Consolidated Freight Classification No. 11, and the second requesting the commission to suspend various east and west bound transcontinental tariffs which continue in effect emergency charges that expire by limitation on December 31, 1936. The League has taken the position that no tariff increases should be permitted to become effective at this time without investigation of the reasonableness and propriety of the rates, under the procedure ordinarily followed by the commission in such matters.

Twin Zephyrs Christened

The new Twin Zephyrs of the Chicago, Burlington & Quincy were christened at 6:30 p. m. on December 17, when Governor Petersen of Minnesota, in his office at the capitol in St. Paul, closed a switch and set up a radio "tone beam," which co-incidently released two suspended bottles of champagne, one in the Union station at St. Paul and the other in the Great Northern station at Minneapolis.

The christening of the seven-car Zephyrs, in which two pairs of sisters, one pair from Minneapolis and the other from St. Paul, participated, marks the climax of a week of transportation activities in the Twin Cities. On Tuesday, December 15, a delegation of more than 100 industrial leaders from St. Paul and Minneapolis traveled non-stop, to Chicago and return. This train, carrying members of two commercial bodies, left Minneapolis 6:30 a. m., St. Paul 7 a. m., and upon arrival in Chicago were guests of the Chicago Association of Commerce at a luncheon at the Union League club. This trek to Chicago comes as a courtesy visit in acknowledgment of the journey, on the first Twin Zephyrs, to the Twin Cities, made in April, 1935, by a Chicago delegation.

Burlington and Alton to Operate Streamliner

The Chicago, Burlington & Quincy and the Alton will establish fast streamlined passenger service between St. Louis, Mo., and Kansas City, on December 20. This train, No. 9902, released from the Twin Cities service on December 18, will be known as the Ozark State Zephyr, a four-car train. It will leave St. Louis at 8:30 a.m. and will arrive at Kansas City at 2 p.m. On its return trip the same day it will leave Kansas City at 4 p.m. and arrive in St. Louis at 9:30 p.m., thereby covering the 279 miles in 5¼ hr.

Motor Carrier Insurance Rules Postponed

The Interstate Commerce Commission has further extended to February 15, 1937, the time for taking effect of its order of August 3 relating to provision by motor carriers of security for the protection of the public. This action was in recognition of the fact that the status of certain carriers and classes of carriers is as yet undetermined by the commission and that hardship might be caused by requiring compliance with the rules of the Commission in the cases of carriers who may ultimately be determined not to be subject to such requirements. Nothing will prevent any carrier subject to the motor carrier act, from furnishing the security provided for in the rules and regulations at any time prior to February 15.

Approval Of Keeshin Unification Recommended

J. Edward Davey, chief of the section of finance of the Interstate Commerce Commission's Bureau of Motor Carriers, has recommended in a proposed report that the commission grant, subject to conditions, the application of the Keeshin Motor Express Company, Inc., of Illinois, for authority to lease the property and operating rights of the Keeshin Motor Express Incorporated, of Indiana, the Keeshin Motor Express Inc., of New York, Bernd Trux, Incorporated, Dickens Motor Freight, Inc., and Scott Transportation Company. The application was opposed by the railroads in western trunk line territory and by those in trunk line territory, not including the Baltimore & Ohio.

Plan for Big "Snow Train" Season

Eastern railroads are making elaborate plans for capitalizing this winter on the growing popularity of "snow train" excursions. Such trains are already being advertised extensively in newspapers, by folders and at New York's winter sports show in Madison Square Garden.

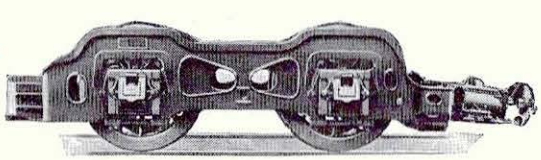
The New York, New Haven & Hartford has set up a program of named "snow trains" to be inaugurated on January 3 by the "Snow Clipper" operating out of New York to Pittsfield, Mass. in the Berkshires. Other excursions to the

Continued on next left-hand page

stop... start... and SLEEP

[THANKS TO THE BOOSTER]

He'd always avoided night travel when he could because every day was an important day and a good night's rest was vital. » » This trip he had to take the train and ride at night. » » To his surprise he slept right through—thanks to the Booster—every start and stop was smooth—he wasn't jarred awake once. » » He woke refreshed and a whole day saved for business. Now he knows Booster-hauled trains save both time and energy. » » Now he's a booster for railroad travel.



FRANKLIN RAILWAY SUPPLY CO., INC.

NEW YORK
CHICAGO
MONTREAL

Berkshires will be the "Snow Express" to Great Barrington, Mass., and South Lee; and the "Snow Special" to Norfolk. The "Ski Meister," a week-end train to the Vermont and New Hampshire resorts, will make its first trip on January 8. This road has also announced the "Snow Train, Jr.," for juniors from 5 to 16 years of age which will be operated Saturdays beginning January 16 from New York to Canaan, Conn.

The New York Central's snow trains, as previously announced, will be operated to various points in the Adirondacks, Catskills, Green Mountains and Bear Mountain. The first of the season, operated in conjunction with the Delaware & Hudson over the New Year's week-end, will go to North Creek, N. Y.

The Pennsylvania on December 11 announced that it would operate out of Philadelphia, Pa., on December 19 "the first 'snow train' originating in any metropolitan area along the Atlantic seaboard." This will be a week-end excursion to Kane, Pa. Other "snow trains" are planned by this road and the Long Island. The latter has announced what it calls "the cheapest 'snow train' excursions from New York City"—to Bethpage State Park on Long Island at a round trip fare of $1.

The Erie, beginning January 3, will operate Sunday "snow trains" out of New York to High Point, N. J., and Tyler Hill, Pa. The Delaware, Lackawanna & Western plans seven Sunday trains to the Pocono Mountains, beginning January 10. The Lehigh Valley, as announced in last week's issue, will this winter enter the "snow-train" field for the first time, operating out of New York to Hazelton, Pa.

Southeast Shippers' Board

Reports of commodity committees presented at a meeting of the Southeast Shippers' Advisory Board at Birmingham, Ala., on December 10, predict an increase of 10 per cent in freight business in Alabama, Florida, Georgia, Louisiana, Mississippi, North and South Carolina, Tennessee and Virginia during the first quarter of 1937, compared with the same period a year ago. Shipments of citrus fruits from Florida are expected to be 30 per cent greater, and of other fresh vegetables 47 per cent heavier than in the first quarter of 1936. A resolution adopted by the board disavowed and condemned any movement looking toward government ownership or operation of American railroads, whether it be open and above board, or concealed beneath efforts to increase unreasonably railway costs of operation, and to the extent that the proposal for a six-hour working day on the railroads will drive the carriers into government ownership.

Keeshin Acquisition Authorized

Division 5 of the Interstate Commerce Commission has issued an order authorizing the purchase by the National Freight Lines, Inc., one of the companies in the Keeshin system, of the property and operating rights of Charles T. Durand, doing business as the National Transfer & Storage Company, which operates in excess of 40 motor vehicles in transportation service in Illinois, Iowa, and Missouri. The order also authorized the acquisition by the Keeshin Transcontinental Freight Lines, Inc., of control of the National Freight Lines by purchase of its capital stock. The report says that the operations of the Keeshin Illinois company and Durand at present constitute through routes so that the situation in this respect would not be changed. It was brought out in the testimony that the Keeshin organization usually purchases a minimum of 100 trailers and from 10 to 15 tractors at one time and is, therefore, able to obtain discounts ranging from 20 to 30 per cent. Similar price reductions are likewise obtained by volume purchases of such items as gas, oil, and tires.

Accident Statistics

The Interstate Commerce Commission's completed statistics of steam railway accidents for the month of September, 1936, now in preparation for the printer, will show:

Item	Month of September		9 months ended with September	
	1936	1935	1936	1935
Number of train accidents	605	491	6,099	4,704
Number of casualties in train, train-service and nontrain accidents:				
Trespassers:				
Killed	267	296	2,110	2,168
Injured	259	297	2,165	2,464
Passengers on trains:				
(a) In train accidents:*				
Killed	...	...	6	....
Injured	50	2	547	302
(b) In train-service accidents:				
Killed	2	2	6	15
Injured	153	124	1,299	1,124
Travelers not on trains:				
Killed	...	...	11	6
Injured	51	46	568	448
Employees on duty:				
Killed	45	35	473	397
Injured	1,836	1,349	16,002	11,885
All other nontrespassers:†				
Killed	139	161	1,276	1,210
Injured	557	511	4,725	4,185
Total—All classes of persons:				
Killed	453	494	3,882	3,796
Injured	2,906	2,329	25,306	20,408

* Train accidents are distinguished from train-service accidents by the fact that the former cause damage of more than $150 to railway property.

† Casualties to "Other nontrespassers" happen chiefly at highway grade crossings. Total highway grade-crossing casualties *for all classes of persons, including both trespassers and nontrespassers*, were as follows:

Number of accidents..	320	309	2,803	2,600
Persons:				
Killed	113	144	1,140	1,127
Injured	383	390	3,266	3,085

Urges Employees to Protect Their Jobs

W. J. Jenks, president of the Norfolk & Western, in his annual Christmas and New Year message, urged employees of that road to study any proposed legislation and express, through their representatives, opposition to measures that are against their own best interest, and which if adopted will reduce traffic and employment on the railroads. Mr. Jenks pointed out that today the transportation industry is keenly competitive and thus "future legislation that imposes substantially higher costs upon the railroads will drive business to other forms of transportation, which means decreased work and employment for railroad employees." On the other hand he noted the general recovery in business during the past year, and stated it to be his belief that "we will march on to greater success."

N. Y. C. Christmas Party

The New York Central will operate again this year a New England Christmas party for persons alone in New York on Christmas or unable to get home over the holiday. This year, as last, the "Christmas Day Special" will leave Grand Central Terminal at 9:35 a. m., December 25, and run to Pittsfield, Mass., in the Berkshires. "Santa Claus" and professional entertainers will make merry on the train both going and returning.

The train will consist of modern coaches, a lounge car and a free observation car. Returning in the late afternoon, the train is scheduled to arrive in Grand Central Terminal at 9:03 p. m. In Pittsfield, an old fashioned New England holiday dinner will be served at the Wendell House where there will also be music, bridge, games and dancing. For winter sports enthusiasts, skiing, skating and other diversions will be offered. The round trip fare (of less than five dollars) will include dinner, entertainment and an automobile or bus ride to one of the many nearby points of interest.

Preliminary Reports Show 17.7 Per Cent Increase in Revenues for November

Preliminary reports from 93 Class I railroads, representing 84.8 per cent of the total operating revenues, made public by the Association of American Railroads, show that, in November they had estimated operating revenues amounting to $300,848,510, compared with $255,560,051 in the same month of 1935 and $332,870,644 in the same month in 1930. Operating revenues of those roads in November were 17.7 per cent above those for November, last year, but 9.6 per cent below November, 1930.

Freight revenues of the 93 Class I railroads amounted to $249,615,704 in November compared with $210,037,459 in November, 1935, and $261,059,845 in November, 1930. Freight revenues in November, this year, were 18.8 per cent above the same month last year, but 4.4 per cent below the same month in 1930.

Passenger revenues, according to these preliminary reports, totaled $27,360,207 in November, this year, compared with $23,839,681 in November, 1935, and $41,765,828 in November, 1930. For the month of November, this year, they were 14.8 per cent above the same month last year, but 34.5 per cent below 1930.

SYLPHON CONTROL—The Fulton Sylphon Company, Drexel building, Philadelphia, Pa., has issued two 40-page bulletins descriptive of the Sylphon control of passenger-car heating and the Sylphon control on ice-activated cars. The arrangements of the modulating temperature control and the automatic differential control, respectively, on these installations are shown diagrammatically.

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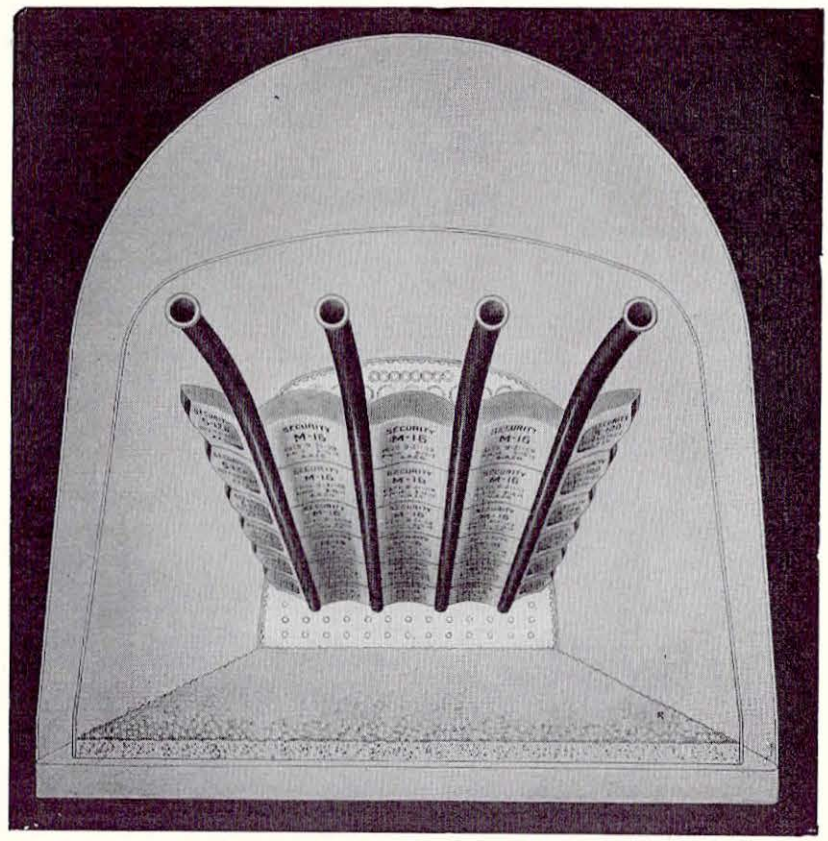
DESIGNING A CORRECT BRICK ARCH



...requires long study and experience

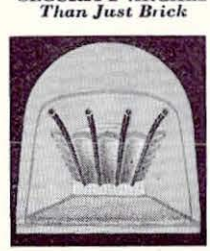
Design starts with the arch supports, the number and position in the firebox, the angle they take between throat sheet and back head. This also determines the arch length.

On the arch length depends the arch effectiveness. Too short, and the gases are not thoroughly mixed and burned, and the fines escape, unburned, out the stack.

American Arch Company engineers have spent a lifetime in studying combustion problems, and brick arch design.

Security Brick Arches assure maximum fuel economy and full boiler capacity.

There's More to SECURITY ARCHES *Than Just Brick*



HARBISON-WALKER REFRACTORIES CO.

Refractory Specialists

AMERICAN ARCH CO.
INCORPORATED

Locomotive Combustion Specialists » » »

Equipment and Supplies

LOCOMOTIVES

THE SOUTHERN PACIFIC has ordered 10 extra locomotive tenders from the Lima Locomotive Works.

THE UNION RAILROAD COMPANY has ordered four Union type (0-10-2) switching locomotives from the Baldwin Locomotive Works. Inquiry for this equipment was reported in the *Railway Age* of November 28.

THE BESSEMER & LAKE ERIE has ordered 10 Texas type (2-10-4) locomotives and two (0-8-0) switching locomotives from the American Locomotive Company. Inquiry for this equipment was reported in the *Railway Age* of November 28.

FREIGHT CARS

THE LAKE SUPERIOR & ISHPEMING is inquiring for from 100 to 200 ore cars of 50 tons' capacity.

THE VIRGINIAN has ordered 25 automobile cars of 50 tons' capacity from the Greenville Steel Car Company. Inquiry for this equipment was reported in the *Railway Age* of November 21.

DENVER, RIO GRANDE & WESTERN.—The Rodger Ballast Car Company has ordered for this road 100 steel Hart selective ballast cars of 70 tons' capacity from the American Car & Foundry Company.

THE GREAT NORTHERN has ordered 500 ore cars from the Bethlehem Steel Company. Inquiry for this material was reported in the *Railway Age* of November 28.

THE WESTERN PACIFIC has ordered 200 box cars from the Mount Vernon Car Manufacturing Company. Inquiry for this equipment was reported in the *Railway Age* of November 7.

THE NORFOLK & WESTERN has ordered 1,000 steel hopper coal cars of 55 tons' capacity, from the Bethlehem Steel Company. Inquiry for this equipment was reported in the *Railway Age* of December 5.

IRON AND STEEL

THE NORFOLK & WESTERN has placed orders for 40,000 tons of 131-lb. steel rail, divided as follows: Carnegie-Illinois Steel Corp., 30,000 tons; Bethlehem Steel Company, 10,000 tons.

MACHINERY AND TOOLS

THE WESTERN PACIFIC has ordered one 200-ton wrecking crane and several special shop tools from the Industrial Brownhoist Company. Inquiry for this equipment was reported in the *Railway Age* of November 7.

Supply Trade

The Wood Preserving Corporation has moved its Boston, Mass., sales office to its plant at Nashua, N. H.

J. E. Mahoney, representative of the **P. & M. Company,** Chicago, has been promoted to Chicago district sales agent.

Charles A. Alden, chief engineer, frog and switch division, **Bethlehem Steel Company,** retired at his own request on November 30. In addition to his work with the steel company, Mr. Alden has long been active in the work of the Manganese Track Society and the Track Committee of the American Railway Engineering Association in developing standards for open-hearth and manganese track work.

John Leeds Kerr, railroad economist, formerly with Young & Ottley, New York, (who will be remembered as a contributor to *Railway Age* and as the author of forecasts of freight car loadings), has established the firm of **Kerr & Co.** to engage in investment research with offices at 1411 Fourth avenue, Seattle, Wash. The firm will concentrate its observations on developments in connection with 100 major corporations (including both railroads and equipment companies) operating in western territory.

TRADE PUBLICATION

ODOR ADSORBERS.—"Consolidated Odor Adsorbers in Air Conditioning" is the title of an eight-page booklet published by the Consolidated Air Conditioning Corporation, 114 East Thirty-Second street, New York. The booklet covers the question of cost of operating an air-conditioning system and stresses the necessity of reducing the amount of "make-up" air. Tables show the savings effected by reducing the amount of make-up air.

Construction

CENTRAL OF NEW JERSEY.—The grade crossing elimination project at Elizabethport, N. J., on which work was suspended in 1932 has now been resumed. This calls for the elevation of the double track of the Elizabethport and Perth Amboy branch to eliminate twelve grade crossings of streets and two grade crossings of railroad branch lines. The project also includes elimination of the grade crossing of main line tracks at Schiller street, and new station facilities at Elizabethport. This work estimated to cost $5,000,000 will be financed in part by a P. W. A. grant.

WABASH.—The Chicago Bridge & Iron Company, Chicago, has been awarded a contract for the fabrication of a 50,000-gal. steel water tank for installation at Springfield, Ill.

Financial

ATCHISON, TOPEKA & SANTA FE.—*Acquisition.*—The Interstate Commerce Commission, Division 4, has authorized this company to acquire control of the Pecos & Northern Texas and the Pecos River by purchase of capital stock.

COPPER RANGE.—*Reorganization Plan.*—The Interstate Commerce Commission has submitted to the stockholders and bondholders, for acceptance or rejection, a plan for the reorganization of this company, as approved by the commission, Division 4, on April 7 and by the judge of the federal district court for the western district of Michigan, northern division, on October 6. By the terms of the bankruptcy act the acceptance or rejection by any creditor or stockholder shall be in writing and the commission has issued a form upon which they are to indicate acceptance or rejection, to be filed with the commission by February 1, 1937.

GULF, MOBILE & NORTHERN.—*Equipment Trust Certificates.*—The Interstate Commerce Commission, Division 4, has authorized this company to assume obligation and liability in respect of $1,440,000 of equipment trust certificates of 1934, to be issued, in amended form, by the Merchants National Bank of Mobile, Ala., and sold at 100.17 and accrued dividends, the proceeds to be applied to the retirement of $698,000 of certificates of 1934 now outstanding and in connection with the procurement of additional equipment.

ILLINOIS CENTRAL.—*Equipment Trust Certificates.*—The Reconstruction Finance Corporation has announced the sale of $13,900,000 of this company's 4 per cent series Q equipment trust certificates maturing 1937-44 to Salomon Bros. & Hutzler, of New York, and Stroud & Co., of Philadelphia, at 103½ and interest, for a premium of $486,500. The purchasers have offered the issues publicly at prices to yield from ½ per cent to 3 per cent.

KANSAS CITY SOUTHERN.—*Equipment Trust.*—Brown, Harriman & Co. and Blyth & Co. have offered $1,278,000 of 3 per cent equipment trust certificates of this company, maturing 1938-43, priced to yield from 0.4 per cent to 1.8.

KANSAS CITY SOUTHERN.—*Refinancing.*—This company has submitted to the Interstate Commerce Commission a plan for the refinancing of the Port Arthur Canal & Dock Company which would enable the Kansas City Southern to reduce its fixed charges by $150,000 a year.

NEW YORK, SUSQUEHANNA & WESTERN.—*Bonds.*—The Interstate Commerce Commission, Division 4, has authorized this company to extend to August 1, 1940, the dates of maturity of $3,744,000 of first-mortgage refunding 50 year 5 per cent gold bonds, maturing January 1, 1937, and $999,000 of second-mortgage 50-year 4½ per cent gold bonds maturing February 1, 1937. The Commission also authorized the Erie to assume obligation and liability

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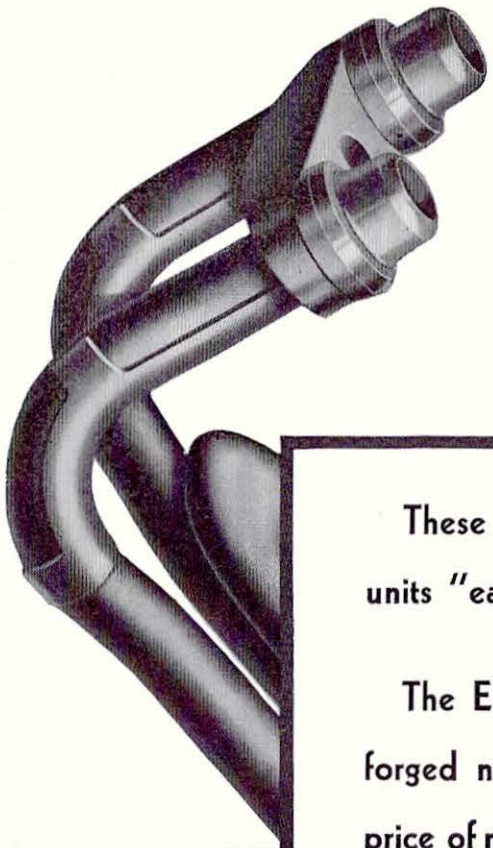


These were once worn-out superheater units "ear-marked" for the scrap heap.

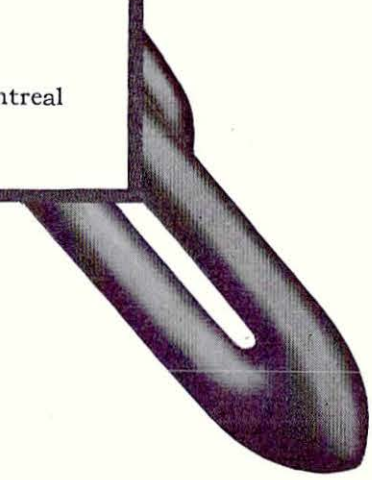
The Elesco "Factory Rebuilt Service" re-forged new life into them at about half the price of new units. They are now like new internally and externally . . . good for many more years of trouble-free service.

Standardize on this dependable service . . . it is economical.

THE
SUPERHEATER
COMPANY

Representative of American Throttle Company, Inc.
60 East 42nd Street, NEW YORK
Peoples Gas Building, CHICAGO
Canada: The Superheater Company, Limited, Montreal

A-1107



ELESCO

in respect of the payment of interest on these bonds for the time of the extension. The Commission also authorized the New York, Susquehanna & Western to issue $447,000 of general mortgage 50-year 5 per cent gold bonds in exchange for a like amount of second mortgage 50 year 4½ per cent gold bonds now outstanding.

MISSOURI PACIFIC.—*Counsel Fees.*—The Interstate Commerce Commission, Division 4, has reaffirmed its decision of May 8 when it found that the maximum reasonable compensation payable to counsel representing this company in the "Gold Clause" case should be $25,000 and that reasonable expenses should be $3,501.56. The amount sought for compensation was $75,000.

NEW YORK CENTRAL.—*Abandonment.*—The Interstate Commerce Commission, Division 4, has authorized the Boston & Albany to abandon part of a branch line extending from Chatham, N. Y., to Ghent, 2.6 miles, and has authorized the New York Central, lessee, to abandon operation on this line. The Commission has also authorized the operation by the Boston & Albany and the New York Central, lessee, over a line of the New York & Harlem between these two points.

NEW YORK, CHICAGO & ST. LOUIS.—*Bonds.*—The Interstate Commerce Commission, Division 4, has authorized this company to extend to January 1, 1947, the date of maturity of $7,250,000 of Lake Erie & Western first mortgage gold bonds with interest at 3 per cent and to assume obligation and liability for the extended bonds, and to pay premiums and commission not exceeding 3 per cent of the principal amount of the bonds in connection with the extension.

PENNSYLVANIA.—*Bonds.*—The Long Island has applied to the Interstate Commerce Commission for authority to issue and sell $10,000,000 of 4 per cent refunding mortgage bonds, maturing March 1, 1949. The bonds are to be sold at 103¾ and accrued interest to Kuhn, Loeb & Co. The Pennsylvania has applied for authority to guarantee the bonds.

PITTSBURGH & WEST VIRGINIA.—*Indictment.*—The Interstate Commerce Commission has received a report from the federal district attorney in Pittsburgh that on December 8 the federal grand jury returned an indictment in six counts against this company for false entries and failure to make full, true and correct entries in the records submitted to the Commission in its annual reports for 1933, 1934 and 1935. The indictment stated that this company contends in its annual report that no other corporation holds control, but the grand jury has found that 73 per cent of the capital stock was and still is owned by the Pennroad Corporation.

WESTERN MARYLAND.—*Equipment Trust Certificates.*—This company has applied to the Interstate Commerce Commission for authority for an issue of $1,590,000 of 2¼ per cent equipment trust certificates. The issue has been sold to Stroud & Co. of Philadelphia at 101.41. The proceeds will be used to purchase 100 all-steel auto cars, 500 all-steel box cars, and 100 all-steel gondola cars.

WESTERN PACIFIC.—*Trustees' Certificates.*—A banking group headed by Lazard Frères & Co. has offered an issue of $6,400,000 trustees' 2¾ per cent two-year certificates of this company at par.

Dividends Declared

Virginian.—Common, $2.50, payable January 2 to holders of record December 16; Preferred, $1.50, Quarterly, payable February 1 to holders of record January 16.

Average Prices of Stocks and of Bonds

	Dec. 15	Last week	Last year
Average price of 20 representative railway stocks..	54.56	54.93	40.96
Average price of 20 representative railway bonds..	84.04	83.62	75.38

Railway Officers

EXECUTIVE

G. Hall Roosevelt has been appointed vice-president and general manager of the Arlington & Fairfax.

W. K. Hammond has been appointed vice-president, assistant secretary and assistant treasurer of the Missouri-Kansas-Texas, with headquarters at New York.

L. F. Loree has resigned as chairman of the board of the Kansas City Southern, effective December 31. He will be succeeded by **Kenneth D. Steere,** who will continue also as chairman of the executive committee.

J. F. Ross, superintendent of organization in the Eastern departments of the Railway Express Agency, with headquarters at New York, has been appointed assistant to vice-president, in charge of operations, Eastern departments, with the same headquarters, succeeding **F. P. Parkinson.** Mr. Ross has been in the express business for 30 years, his first assignments were at Boston, Mass., where after some clerical experience, he was transferred to the operating department. In June, 1916, he was again transferred to the accounting department, becoming chief accountant the next year. Returning to the operating department, Mr. Ross was appointed supervisor in the terminal service and then superintendent of the Boston terminals. In November, 1923, Mr. Ross became a member of Railroad Committee "B," and in July, 1929, was appointed special representative in the vice-president's office at New York. In March, 1933, Mr. Ross was appointed superintendent of organization in the Eastern departments, which position he held until his recent promotion.

J. F. Ross

J. F. Glover, superintendent of organization in the Central departments of the Railway Express Agency, has been appointed assistant to the vice-president in charge of operations in the Central departments, with headquarters as before at Chicago, to succeed **Harry H. Meek,** who has retired.

Mr. Glover entered the service of a predecessor of the Railway Express Agency in 1903 at St. Louis as a stenographer, later serving as secretary to several operating officers in Chicago until 1909, when he went into business for himself. Returning to the express company two years later, he eventually became route agent at Hammond, La., and later at Fulton, Ky. Subsequently he served three years as chief clerk to the superintendent at Memphis, Tenn., then, in 1918, being transferred to the general manager's office at Cincinnati, Ohio, as chief clerk. After six years in this capacity he was appointed superintendent of organization in the same territory and in December, 1927, he was further promoted to operating superintendent of the Cincinnati division. In April, 1934, Mr. Glover was appointed superintendent of organization in the Central departments at Chicago, which position he was holding at the time of his recent appointment as assistant to the vice-president, effective on December 1.

J. F. Glover

Mr. Meek retires with a record of more than 51 years of continuous service in the express business. He began as an express messenger at Keokuk, Iowa, and later was advanced through the positions of cashier, route agent, agent at Nashville, Tenn., and chief clerk to the superintendent at Memphis, Tenn. In 1912 he was appointed chief clerk in the general manager's office and

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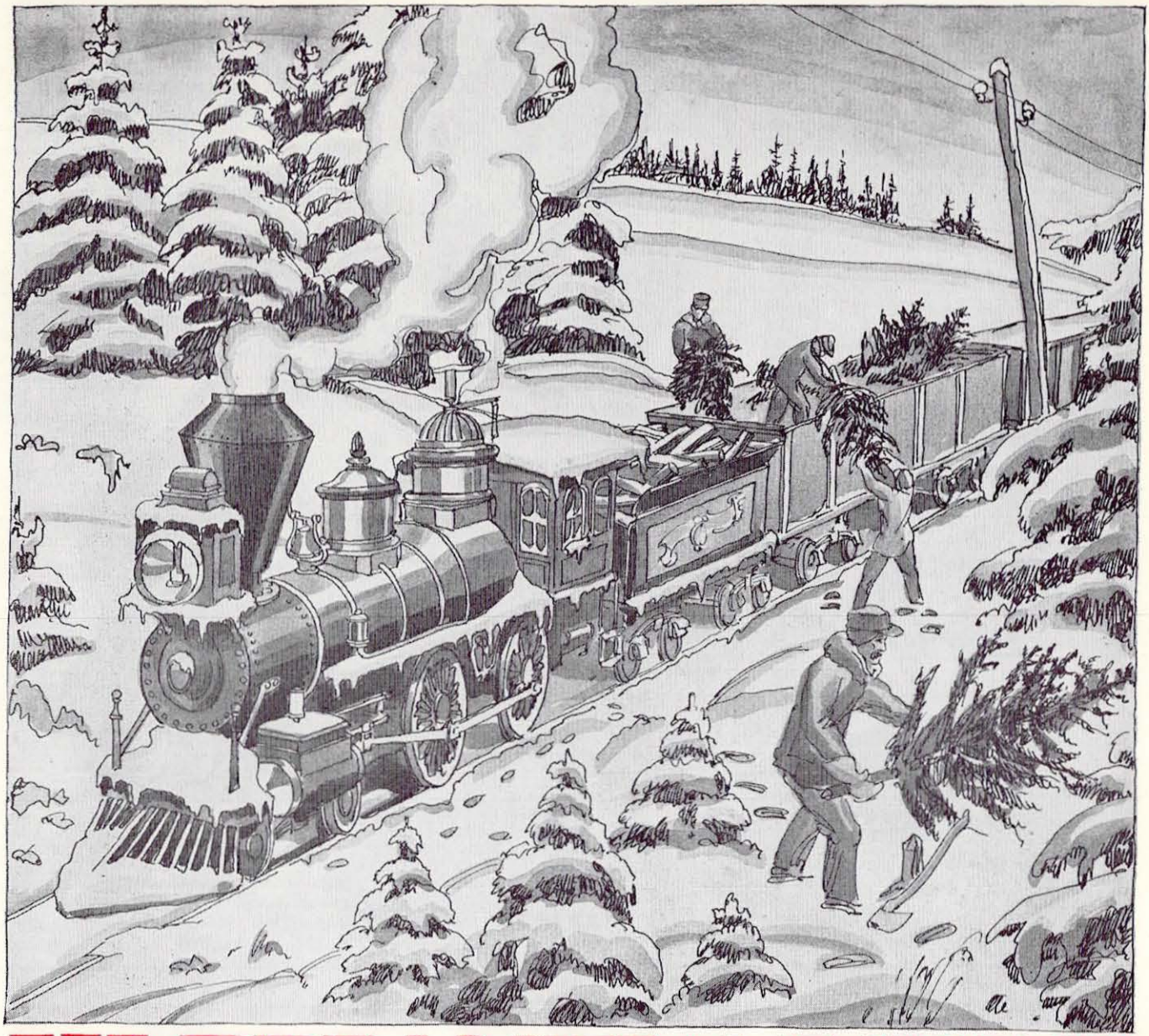
MERRY CHRISTMAS



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in May, 1915, he was advanced to superintendent, with headquarters at Kansas City, Mo. In July, 1918, coincident with the consolidation of express companies, Mr. Meek was made superintendent at Memphis, Tenn., and after 10 years in that capacity he was appointed superintendent of organization in the Central territory, holding this office first at St. Louis, Mo., and later at Chicago. In April, 1934, he was appointed assistant to the vice-president in charge of operations in the Central departments, the position he was holding at the time of his retirement on November 30.

E. P. Mallory, assistant to the president of the Canadian National, with headquarters at Montreal, Que., has been appointed executive assistant to the president and **M. A. Metcalf,** secretary to the president, has been appointed assistant to the president of the system. Mr. Mallory was born at St. Andrews, N. B., on October 31, 1878, and began his railroad career in 1896 in the operating department of the Canadian Pacific. He resigned in December, 1899, to enlist for service in the South African war and after peace was declared he continued in the engineering department of the South African Government Railways at Pretoria until 1908, when he returned to Canada and entered the service of the Canadian Northern at Toronto, serving in various capacities in the operating and construction departments. In 1918 when the Canadian National was organized, Mr. Mallory was assigned to the president's office at Toronto, where he developed the system of operating control statistics which is still in effect on the system. In 1923 Mr. Mallory was appointed director of the bureau of statistics at Montreal. His jurisdiction was extended to include the headquarters budgetary control system in 1930 and the duties of secretary of the finance committee of the board of directors in 1932. In 1929 and again in 1930, Mr. Mallory's services were loaned to the Mexican Government as advisor to the National Railways Re-organization Committee headed by General Calles, the former President of Mexico. In 1934 Mr. Mallory became assistant to the president, the position he held until his recent appointment.

E. P. Mallory

Maynard A. Metcalf was born in Toronto on December 23, 1895, and joined the Canadian operating department at Toronto in 1910 as junior clerk. He became secretary to the general manager in December, 1917, and secretary to the vice-president in charge of operating and construction three years later. On the formation of the present Canadian National system in 1922 Mr. Metcalf became secretary to the operating vice-president and since 1934 has been secretary to the president of the system.

M. A. Metcalf

FINANCIAL, LEGAL AND ACCOUNTING

Franklin K. Lane has been appointed secretary and legal adviser of the Arlington & Fairfax.

G. M. Wahl, secretary of the Gulf, Mobile & Northern, with headquarters at Mobile, Ala., has been appointed also assistant treasurer.

TRAFFIC

J. C. LaCoste, assistant general freight agent on the Chicago, Rock Island & Pacific at Kansas City, has been promoted to general freight agent at the same point to succeed **F. J. Shubert,** retired. **C. N. Mabie,** agent at Memphis, Tenn., has been appointed assistant general freight agent at the same point to succeed **F. C. Johnson,** retired.

PURCHASES AND STORES

K. H. Suder has been appointed purchasing agent for the Akron, Canton & Youngstown and the Northern Ohio, with headquarters at Akron, Ohio.

OPERATING

H. W. Layfield, train dispatcher on the Delmarva division of the Pennsylvania, has been promoted to assistant trainmaster-division operator of the Columbus division, with headquarters at Columbus, Ohio, to succeed **R. F. Holaday.**

William H. Dodd, general manager of transportation in the eastern departments of the Railway Express Agency, with headquarters at New York, has retired from the express service. **F. P. Parkinson,** assistant to vice-president, has been appointed general superintendent of transportation, Eastern departments, with headquarters at New York. **W. G. White** has been appointed superintendent of organization, Eastern departments, at New York, succeeding **J. F. Ross.** Mr. Dodd was employed in various large express offices in New York City during his first 20 years as an expressman. He started in May, 1888, as an office boy and later became clerk in the Madison Avenue depot. Ten years later he returned there to serve as assistant agent for four years and from July, 1904, to April, 1910, as agent in charge. During intervening periods he served as agent at various points in New York City. From April, 1910, to September, 1917, Mr. Dodd served as general agent at Rochester, N. Y., Buffalo, and Washington, D. C. He returned to New York to become superintendent of transportation and in June, 1919, was appointed general manager of the transportation department in the Eastern territory, a post he held continuously until his retirement.

William H. Dodd

Mr. Parkinson has been identified with the express service for 37 years. Starting in the superintendent's office in 1899, he held various positions in New York and Buffalo, becoming chief clerk in the Madison Avenue station in New York

F. P. Parkinson

City in 1910 and superintendent of transportation two years later. He was appointed chief clerk to the general man-

W. G. White

ager of the Eastern departments in 1915, which position he held until the consolidation of companies in July, 1918, when he became superintendent of claims in the Eastern territory. Two years later he was appointed special assistant to vice-president and in November, 1927, he became assistant to vice-president, which position he held at the time of his recent appointment.

Mr. White has been in the express service for 33 years, beginning in 1903 at Norfolk, Va., where he was employed for five years. He subsequently served at Baltimore, Md., Richmond, Va., and engaged in special route agency work on the line. Mr. White went to Philadelphia in August, 1915, to become chief clerk to the general manager and two years later became assistant to vice-president and general manager in that city. In September, 1918, shortly after the express companies were consolidated, Mr. White was transferred to New York to become assistant to general manager of transportation in the Eastern departments, a position he held for nearly 17 years. In April, 1935, he was assigned to the office of the vice-president for special work, which he continued until his recent appointment.

MECHANICAL

M. L. Carlson has been appointed superintendent of motive power of the Missouri & Arkansas, with headquarters at Harrison, Ark., to succeed **E. A. Shull,** who has resigned.

J. S. Bell, assistant enginehouse foreman on the Philadelphia Terminal division of the Pennsylvania, has been promoted to assistant master mechanic of the Columbus, Cincinnati and Toledo divisions, with headquarters at Columbus, Ohio.

SPECIAL

Roger W. Birdseye has been appointed general advertising manager of the Atchison, Topeka & Santa Fe, effective December 1, with headquarters at Chicago, to succeed the late **Carl J. Birchfield.** Born in Brooklyn, N. Y., Mr. Birdseye was graduated from the Horace Mann school and later attended Amherst college. He received his early business training in New York, with Stephen T. Williams & Staff, and later was employed in advertising work by other concerns. Upon the outbreak of the World war, Mr. Birdseye enlisted in the Canadian Expeditionary Force in 1914 and went to France, being wounded in the battle of the Somme and invalided home. In 1918 he was employed by the Guaranty Trust Company as confidential secretary and assistant to the vice-president in charge of the advertising department, holding this position until 1921, when severe illness forced him to go to northern Arizona for his health. He was first employed by the Santa Fe in 1925 as a special representative of the advertising department at Santa Fe, N. M. In October, 1933, he was sent

Roger W. Birdseye

to Chicago and appointed assistant to the general advertising manager, the position he held at the time of his recent appointment.

OBITUARY

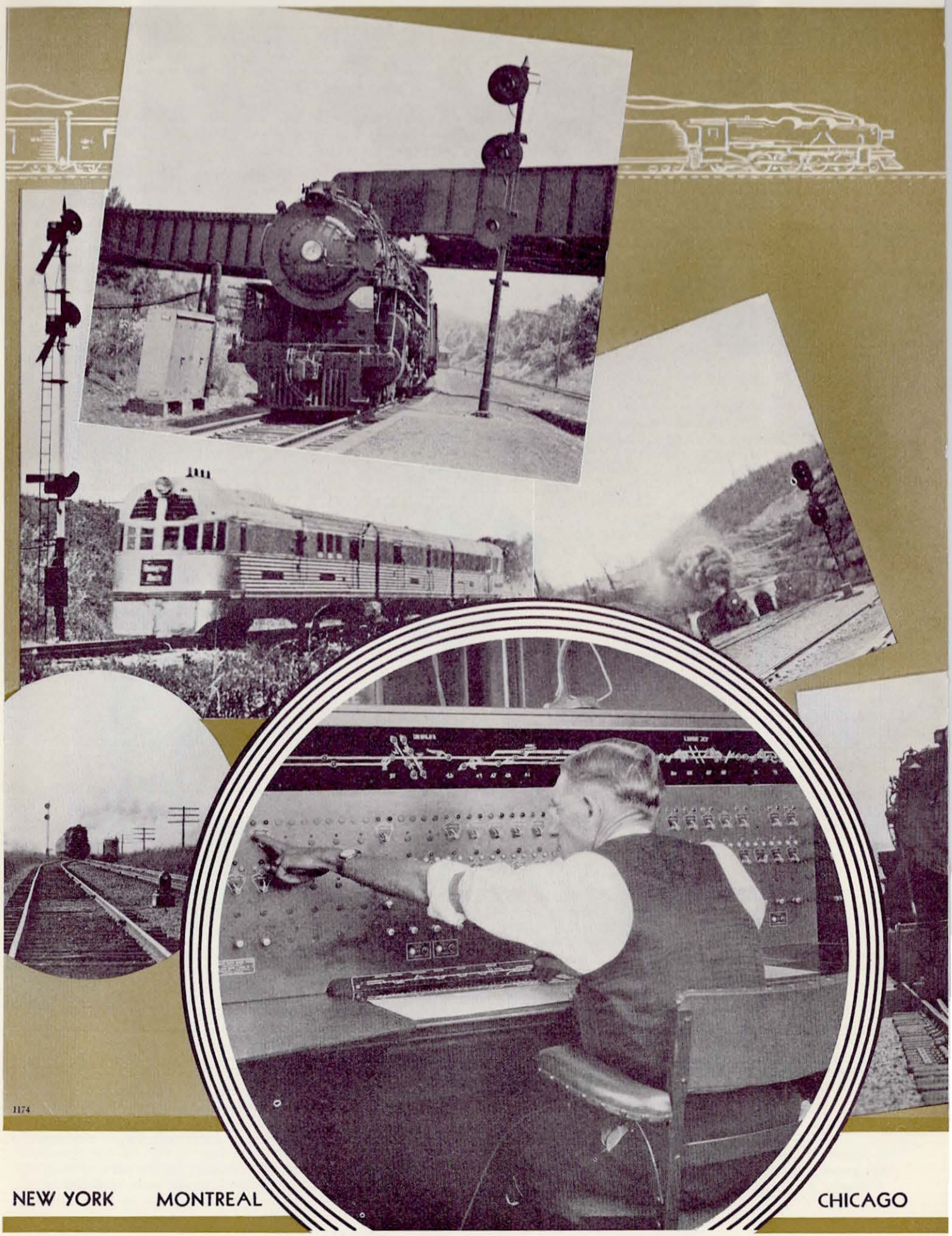
J. Jervis Vail, special engineer in the construction department of the New York zone of the Pennsylvania, with headquarters at Newark, N. J., died suddenly on December 2 at Norfolk, Va., where he had gone for his health. Mr. Vail, who was 59 years old, had been with the Pennsylvania, in its construction department, for 38 years, and had been associated with many of its larger engineering projects in the east.

Edward Francis Stephenson, secretary of the New York Central system, with headquarters at New York, died on December 12, at his home in Dumont, N. J., after an illness of several months. Mr. Stephenson was born on July 19, 1868, at Philadelphia, Pa., and entered railway service in May, 1885, serving until 1890 as clerk in the car record office and general superintendent's office of the New York, West Shore & Buffalo (now West Shore). From November, 1890, to May, 1909, he served as clerk in the secretary's office of the New York Central & Hudson River (now New York Central) and from the latter date until February, 1920, as assistant secretary of the Lake Shore & Michigan Southern (now New York Central) and the Michigan Central. Mr. Stephenson was assistant secretary of the Cleveland, Cincinnati, Chicago & St. Louis from June, 1911, to February, 1920, when he was appointed secretary of the New York Central and subsidiaries.

Porter Allen, chief engineer maintenance of way of the Western region of the Pennsylvania, with headquarters at Chicago, died at his home in Winnetka, a suburb of Chicago, on December 12. Mr. Allen's death was due to heart disease and followed an illness of several months. He was born at Williamsport, Pa., on August 15, 1880, and graduated from Lafayette College in 1902. His entire railway service, which extended over a period of 34 years, had been with the Pennsylvania. He entered the service of that company on June 21, 1902, in the office of the principal assistant engineer at Williamsport, Pa., as a rodman. In August of the same year Mr. Allen was transferred to Elmira, N. Y., being advanced to transitman at Altoona, Pa., in 1905. On March 10, 1906, he was transferred to the operating department as assistant superintendent at Washington, Pa., and in September, 1908, he was transferred to Lancaster, Pa., where he remained until August 1, 1911, when he was appointed supervisor at Uniontown, Pa. From May 1, 1915, to September 16, 1918, Mr. Allen served in this capacity on the Buffalo division at Olean, N. Y., and on the Middle division, then being promoted to division engineer

Porter Allen

of the Cleveland and Pittsburgh division of the Central region, with headquarters at Cleveland, Ohio. In 1923 he returned to the operating department as superintendent of the South Bend division, with headquarters at Logansport, Ind., being transferred to the Norfolk division, with headquarters at Cape Charles, Va., in the following year and thence to the Eastern division of the Central region, with headquarters at Pittsburgh, Pa., in September, 1926. On June 1, 1927, he was promoted to chief engineer maintenance of way of the Western region, with headquarters at Chicago, which position he held until his death.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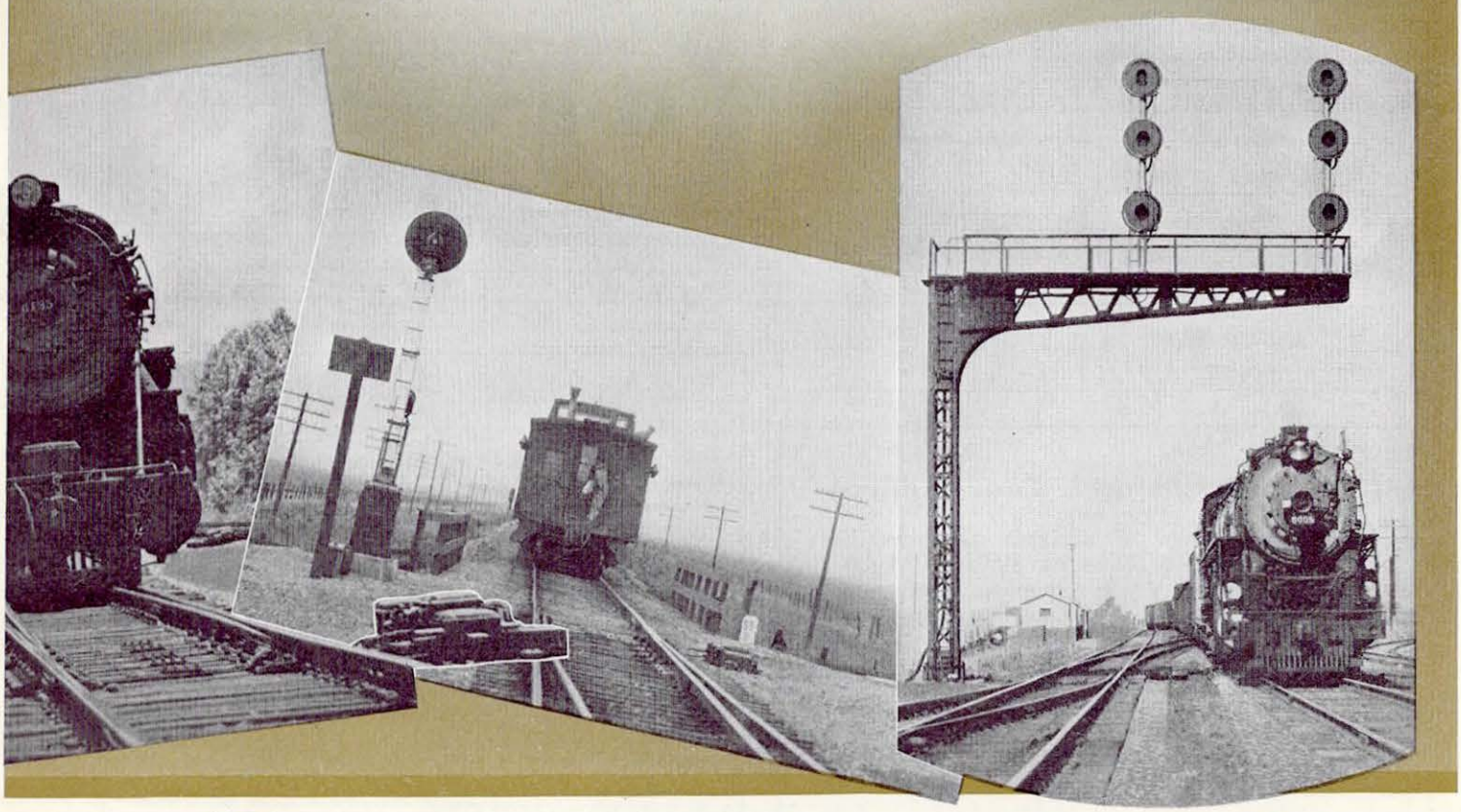

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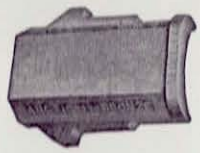

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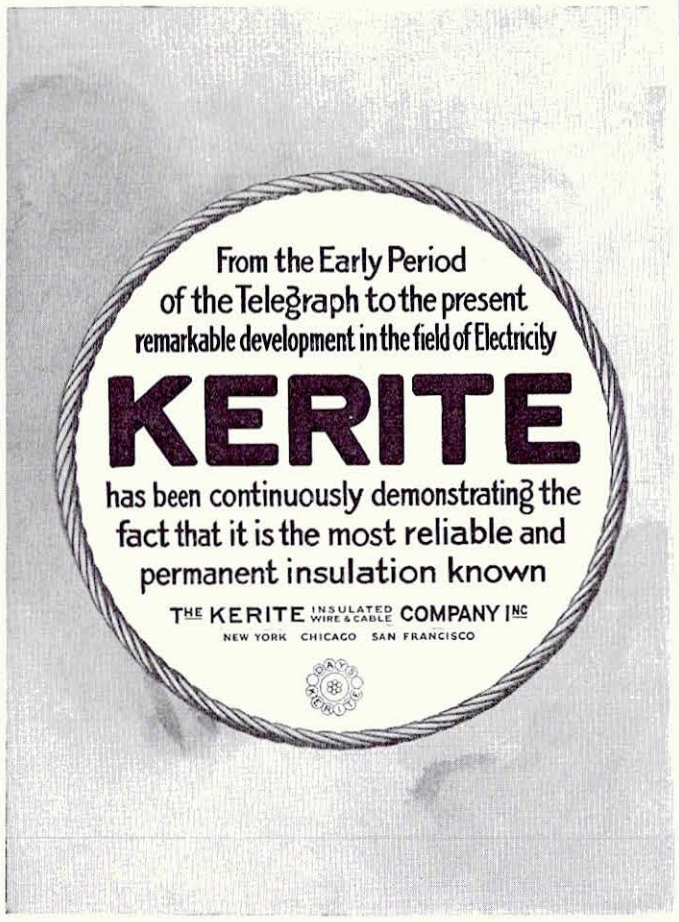
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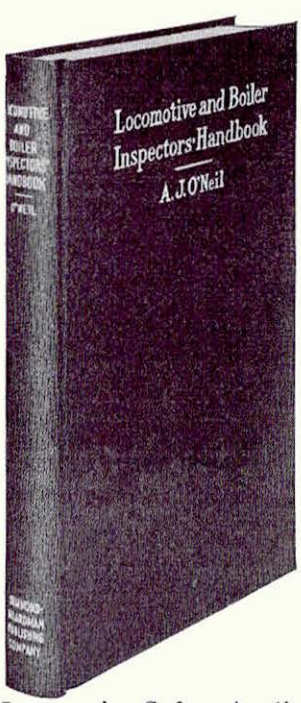

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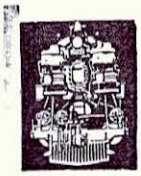

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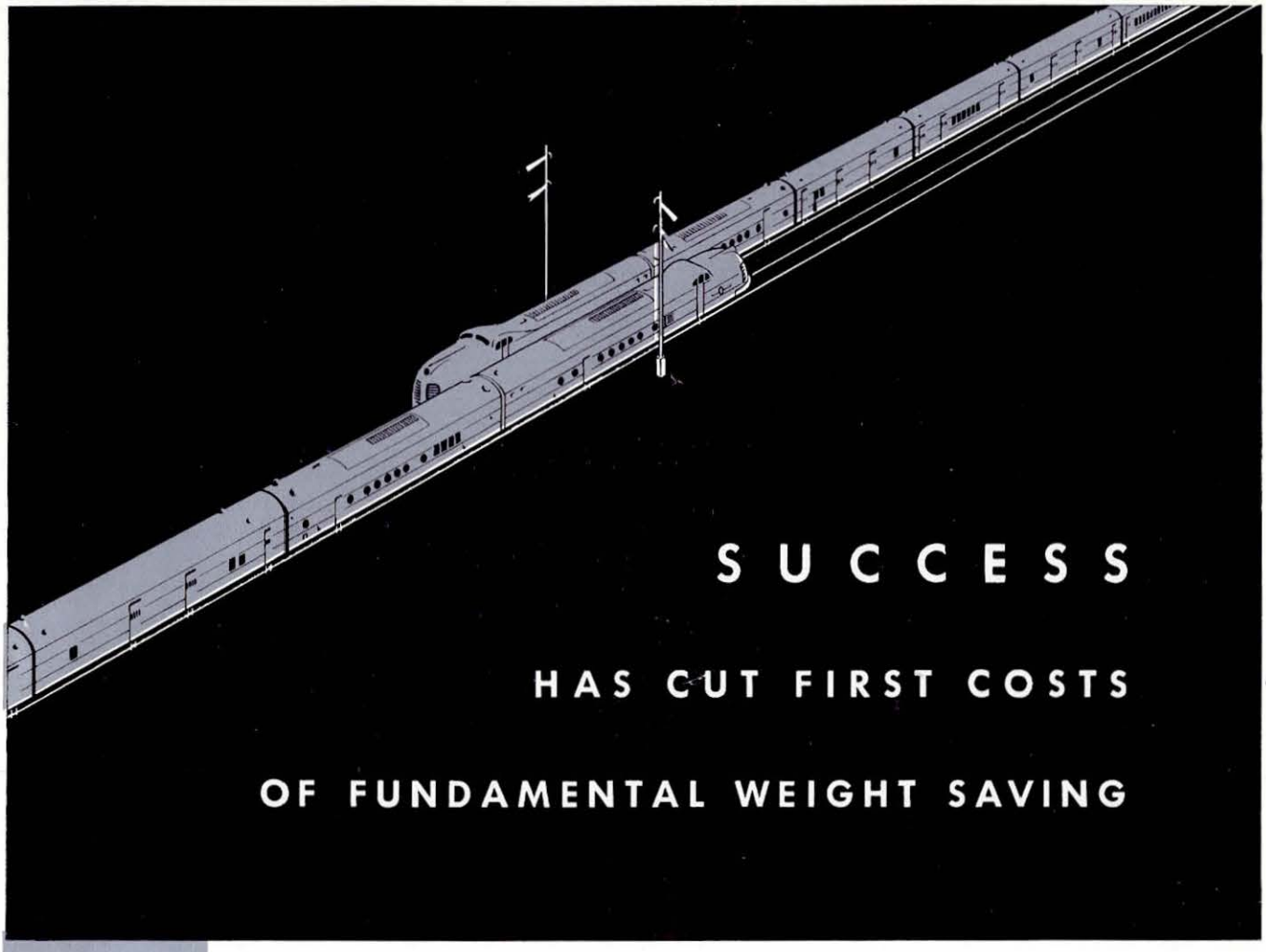

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Engineers at first "tried" the strong Aluminum alloys. Now, these materials are found in the "standard" classification. Their worth has been proved. The many forms of Aluminum alloys available for train construction have been studied. Certain structural members, and inside trim, may best be made of extruded shapes that interlock or otherwise facilitate assembly. Aluminum alloy sheet for doors, partitions, roofs, etc., is light, strong and resistant to corrosion. Aluminum castings and forgings also have played their part in developing standardized, light-weight train construction. Aluminum foil replaces heavier insulation.

Moreover, intense study of weight-saving design by builders has led to new ways of using standard rolled sections of strong Alcoa Aluminum alloys. As a result, still more construction economy.

The first reason for designing with alloys of Alcoa Aluminum is superior operating economy. Economy in construction is an equally definite reason. Ask us for the full story. ALUMINUM COMPANY OF AMERICA, 2178 Gulf Building, Pittsburgh, Pennsylvania.

ALCOA ALUMINUM

Greetings

With sincerest wishes to all for a

Merry Christmas

and a

Happy New Year

HUNT-SPILLER MFG. CORPORATION

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